New Products

Section 1

New Products

Selection Guides

Applications

Cross Reference

TelCom
Semiconductor, Inc.

STEP-UP/STEP-DOWN PWM DC/DC CONVERTER WITH VOLTAGE DETECTOR

FEATURES

- **Low quiescent current .... typ 50µA (TC153624; V_{IN}=3.0V, No Load)**
- **Low standby current .... 1.0µA MAX**
- **Low voltage operation .... V_{IN} = 0.9~10V**
- **High accuracy output voltage .... ±2.5%**
- **Variety of output voltage levels**
- **Soft start and driver proof circuit**
- **Phase compensation circuit**
- **Small package .... 8-Pin SOIC**
- **Larger current can be obtained by connecting an external power transistor**

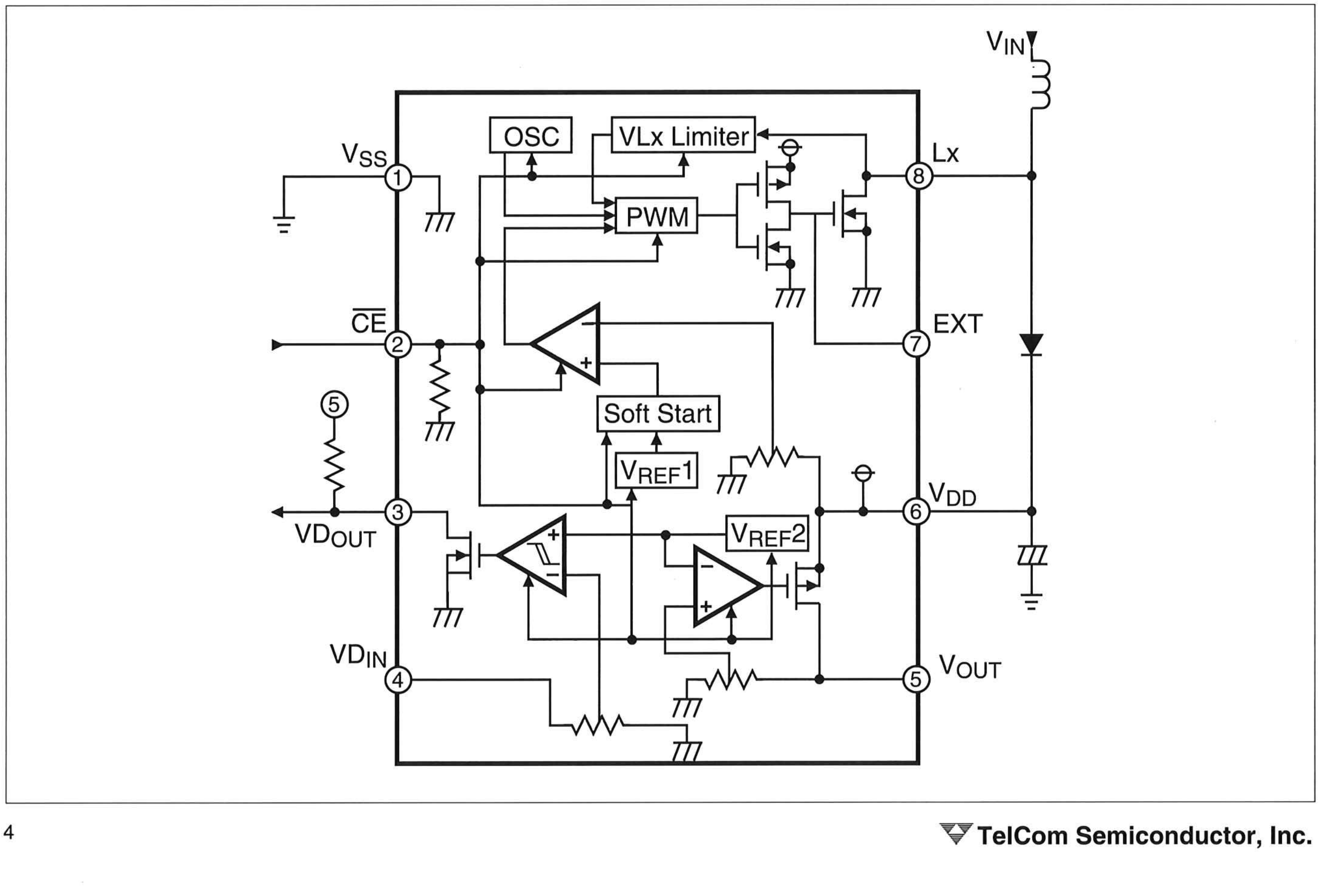
APPLICATIONS

- **Laptop computers and portable automation equipment**
- **Pagers, cellular and cordless telephones**
- **Cameras and hand-held systems**

GENERAL DESCRIPTION

The TC15 Series ICs are compact DC/DC converter ICs with voltage detectors, developed using Tough CMOS™ process technology. The devices consist of a PWM type DC/DC converter, a series regulator and a voltage detector. With three external components, a coil, a diode, and a capacitor, the output is made constant. When the input voltage is sufficiently high, they work as series regulators. When the input voltage drops, they work as step-up DC/DC converters. The TC15 series includes a voltage detector which is capable of measuring the output voltage. The chip enable can switch off the DC/DC converter while the voltage detector can save consumption current by switching to standby. The TC15 is ideal for battery-operated equipment.

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

STEP-UP/STEP-DOWN DC/DC CONVERTER WITH VOLTAGE DETECTOR

FEATURES

- Low quiescent current .... typ 15µA (TC163625; V_{IN}=3.0V, No Load)
- Low standby current .... 1.0µA MAX
- Low voltage operation .... VIN = 0.9~10V
- High accuracy output voltage .... ±2.5%
- Variety of output voltage levels
- Soft start and driver proof circuit
- Phase compensation circuit
- Small package .... 8-Pin SOIC
- Larger current can be obtained by connecting an external power transistor

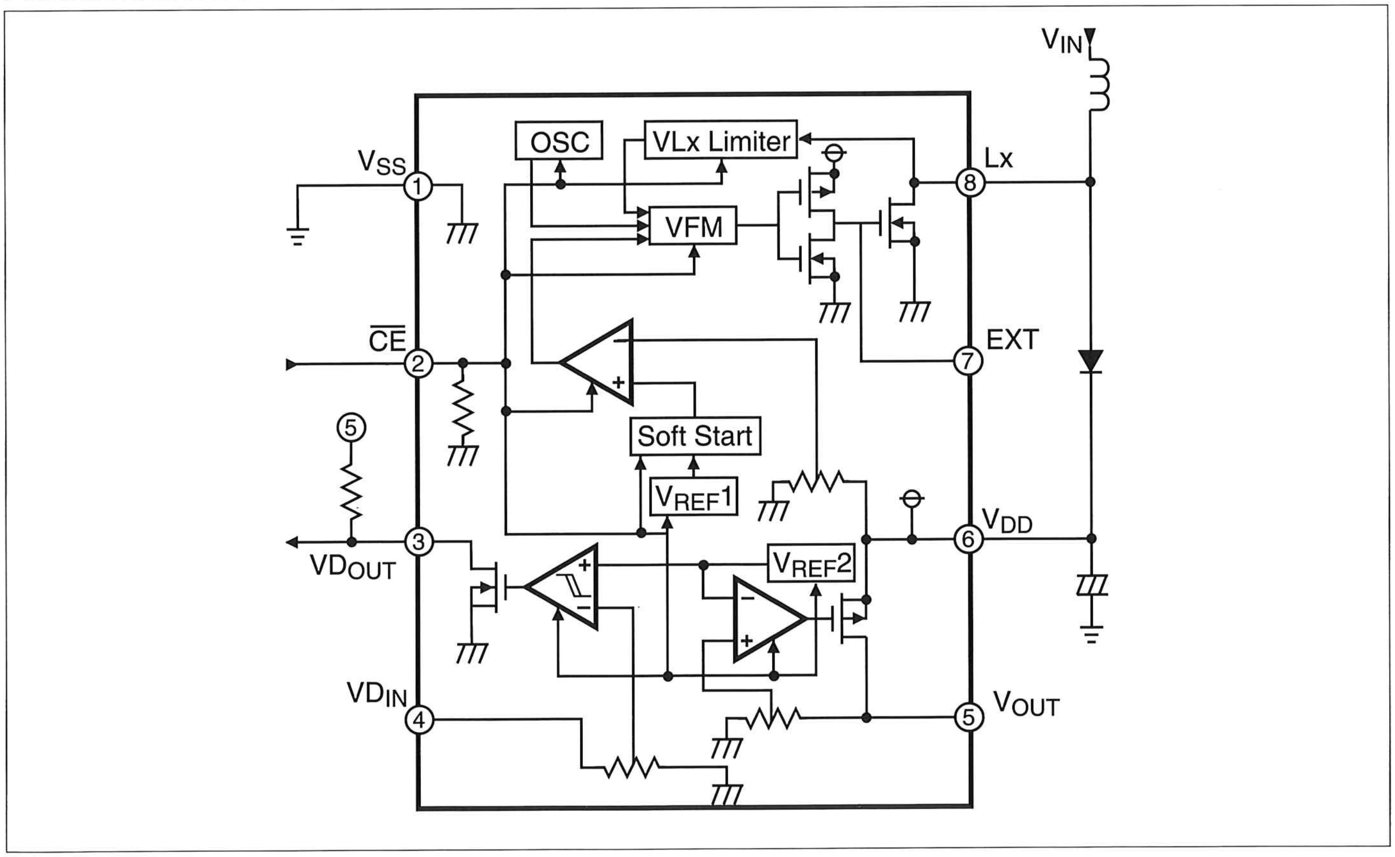
APPLICATIONS

- Laptop computers and portable automation equipment
- Pagers, cellular and cordless telephones
- Cameras and hand-held systems

GENERAL DESCRIPTION

The TC16 Series ICs are compact DC/DC converter ICs with voltage detectors, developed using Tough CMOS™ process technology. The devices consist of a VFM type DC/DC converter, a series regulator and a voltage detector. With three external components, a coil, a diode, and a capacitor, the output is made constant. When the input voltage is sufficiently high, they work as series regulators. When the input drops, they work as step-up DC/DC converters. The TC16 series includes a voltage detector which is capable of measuring the output voltage. The chip enable can switch off the DC/DC converter while the voltage detector can save consumption current by switching to standby. The TC16 is ideal for battery-operated equipment.

FUNCTIONAL BLOCK DIAGRAM



TelCom Semiconductor, Inc.

TC17 Series

PWM STEP-UP SWITCHING REGULATOR

FEATURES

- Only 3 external components required. Coil, diode, capacitor
- Low consumption current .... 30μA (Typ. 501A)
- Low ripple, Low noise
- Low voltage operation .... 0.9V Max. (Output current 1mA)
- High accuracy output voltage .... ±2.5% Max.
- High efficiency .... 85% Typ.
- Small temp. drift of output voltage . ±50ppm (Typ.)
- Slow start .... 500μs Min.
- Compact package SOT-89
- Larger current can be obtained by connecting an external power transistor

APPLICATIONS

- Constant voltage source for battery-operated products
- Constant voltage source for cameras, electronic and portable communication products
- Constant voltage source for devices that require low noise and low power consumption such as portable equipment
- Constant voltage source for devices that require a higher voltage than battery voltages

GENERAL DESCRIPTION

The TC17XX1A/XX2B Series ICs are PWM control step-up switching regulators developed with Tough CMOS™ technology.

The xx1A Series ICs consist of an oscillator circuit, PWM control circuit, control transistor (Lx switch), reference voltage source, error amplifier circuit, phase correction circuit, voltage detection resistor, slow start circuit, and Lx switch protection circuit.

Unlike other PWM switching regulator ICs, the xx1A Series ICs do not require complex external circuits. Only three components—coil, diode and capacitor—are required for the low-ripple, high-efficiency step-up switching regulator ICs.

The xx2B ICs internally use the same chip as the xx1A Series, but have an external transistor drive pin (EXT) instead of an Lx pin. Attaching an external power transistor with a small ON resistance allows a large current to flow in the coil, producing a large output current. The xx2B Series ICs are suitable for applications that require large output current between 10mA and 100mA.

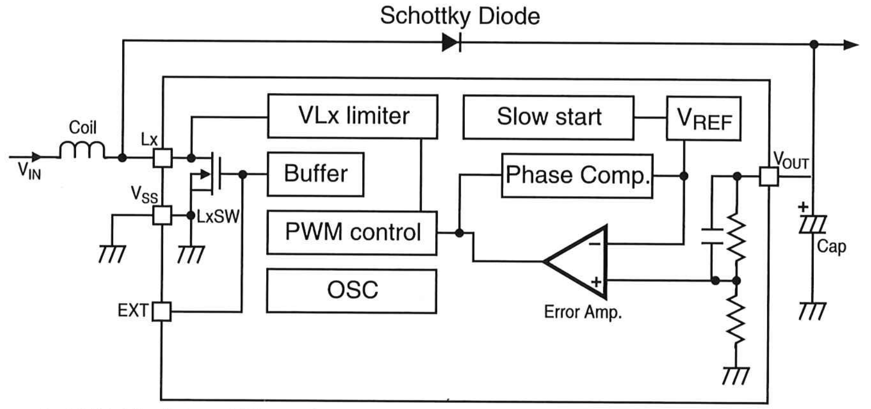
The PWM control circuit limits the power consumption of these ICs to 30μA Typ. on 5V versions.

When the input voltage is higher than the specified output voltage and the voltage drop in the diode coil, the oscillator circuit stops to reduce its own power consumption to 2μA Typ.

These ICs are suitable for users who need low ripples but cannot use conventional PWM switching regulators because of high power consumption.

The high performance and low power consumption of these ICs makes them ideal for battery-operated devices.

FUNCTIONAL BLOCK DIAGRAM



The gain of the Error Amp. is 80dB. The internal Phase Comp. circuit yields a frequency characteristic where the first pole is at 0.05Hz and zero point is at 500Hz. The dividing resistor and capacitor connected to V_{OUT} pin yields a zero point at fz = 1.5kHz.

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Semiconductor, Inc.

TC18 Series

VFM STEP-UP SWITCHING REGULATOR

FEATURES

- Only 3 external components required .... Coil, diode, capacitor
- Ultra Low consumption current .... 4µA (3V, 1.5V Input, No Load, Typ.)
- High accuracy output voltage .... ±2.5% Max.
- Low voltage operation .... 0.9V Max. (Output current 1mA)
- High efficiency .... 80% Typ.
- Small temp. drift of output voltage . ±50ppm (Typ.)
- Compact package SOT-89
- Larger current can be obtained by connecting an external power transistor

APPLICATIONS

- Constant voltage supply for battery-operated products
- Constant voltage supply for cameras, electronic and portable communication products
- Constant voltage source for devices that require a higher voltage than battery voltages

GENERAL DESCRIPTION

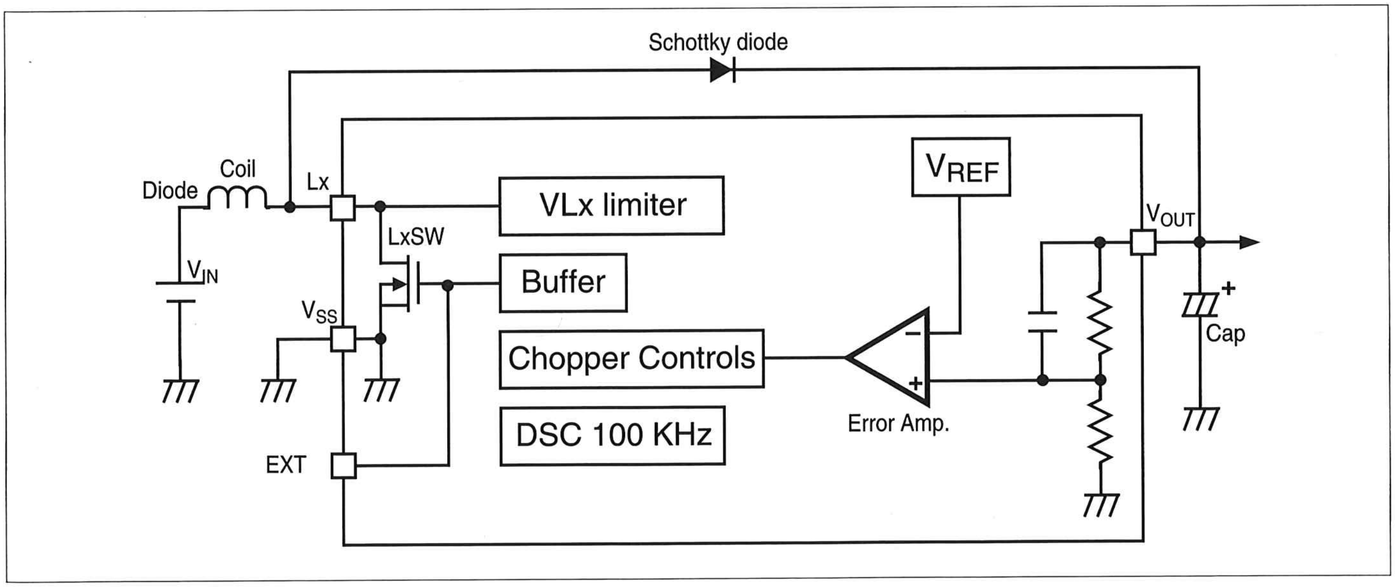
The TC18xx1 and xx2 are VFM (chopper) control type—low current consumption, step-up switching regulator ICs developed using low power linear Tough CMOS™ technology.

The xx1 type internally comprises an oscillator, VFM control circuit, control transistor (Lx switch), standard voltage supply, differential amplifier circuit, voltage sensing resistor and an Lx switch protective circuit using a mere three externally connected components (a coil, diode and capacitor). The connection of a complex external component arrangement necessary until now in conventional devices has been eliminated in this high efficiency rising voltage switching regulator.

The xx2 type utilizes the same chip as the xx1 type. A transistor drive terminal (EXT) has been connected externally in place of the Lx terminal. The connection of a small external power transistor with a low on resistance allows a large current to flow into the coil producing a large current. This device is ideal for the user who needs current output from less than one hundred all the way up to several hundred milliamps.

The TC18 series is ideal for use with battery operated devices and combines high efficiency operation with ultra low current consumption.

FUNCTIONAL BLOCK DIAGRAM



MULTI-POWER-SUPPLY SYSTEM

FEATURES

- Low power consumption
- Wide operating voltage range .... 1.5V ~ 10.0V
- High accuracy output voltage and detect voltage .... ±2.5%
- Voltage selection of output and detect . 0.1V steps
- Low temperature coefficient of output and detect .... typ. ±100ppm/°C
- Low Dropout Voltage .... 50mV for I_{OUT}=80mA
- Small package .... SOP-16 (0.8mm pitch)
- Possible direct connection to CPU due to the built-in level shift circuit

APPLICATIONS

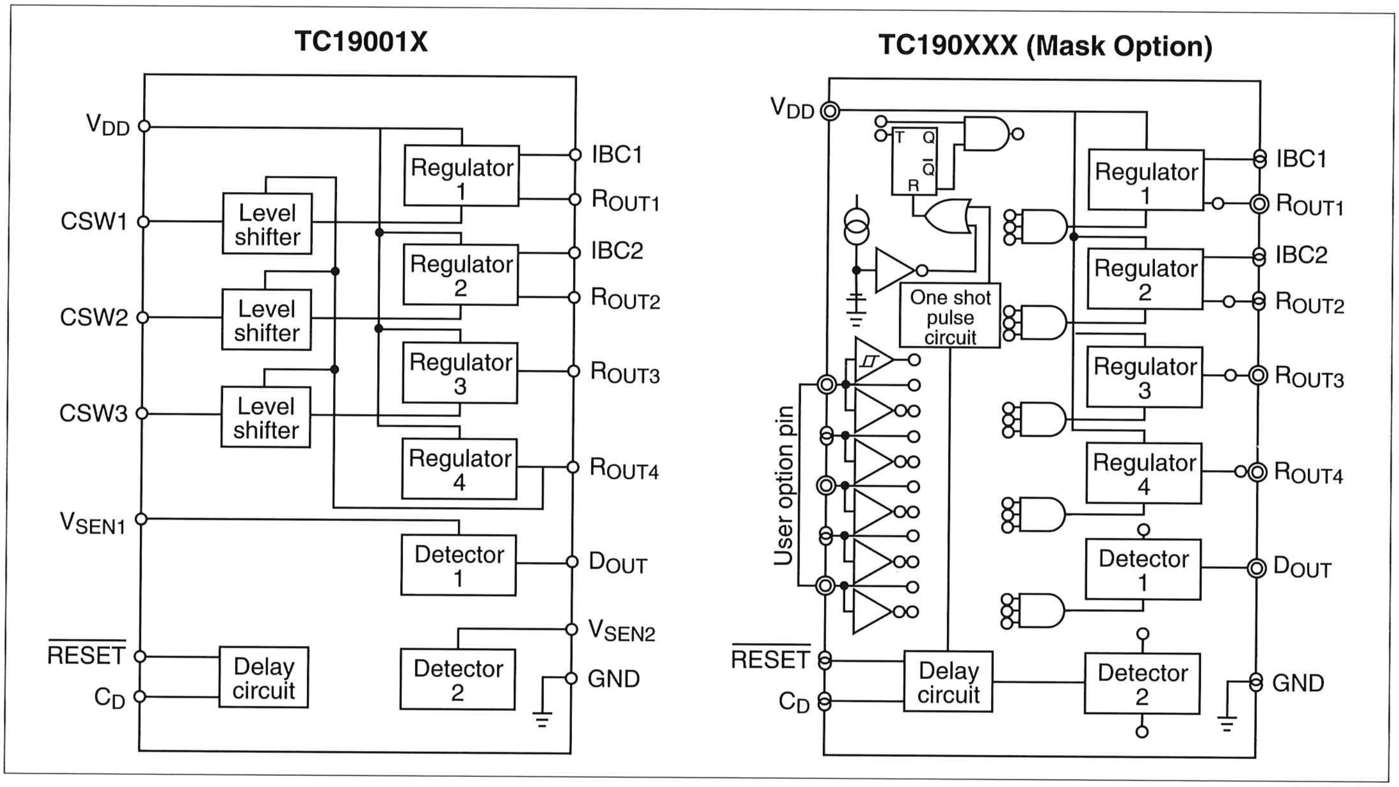
- Constant voltage supply for battery-operated devices
- Constant voltage supply for electronic and portable communication devices

GENERAL DESCRIPTION

The TC19 Series consist of high precision, low current consumption multipower supply ICs. This chip series is internally comprised of 4 voltage regulators, 2 monitoring voltage detectors and a control switch manufactured with Tough CMOS™ process technology. The device allows the user to select the ideal power supply to match his system with a mask option providing features such as user setting of pin terminals and ON/OFF control of each circuit.

TelCom's unique trimming technology allows the output voltage and detection voltage to be set internally in the IC. The device package is a SOP-16.

FUNCTIONAL BLOCK DIAGRAM



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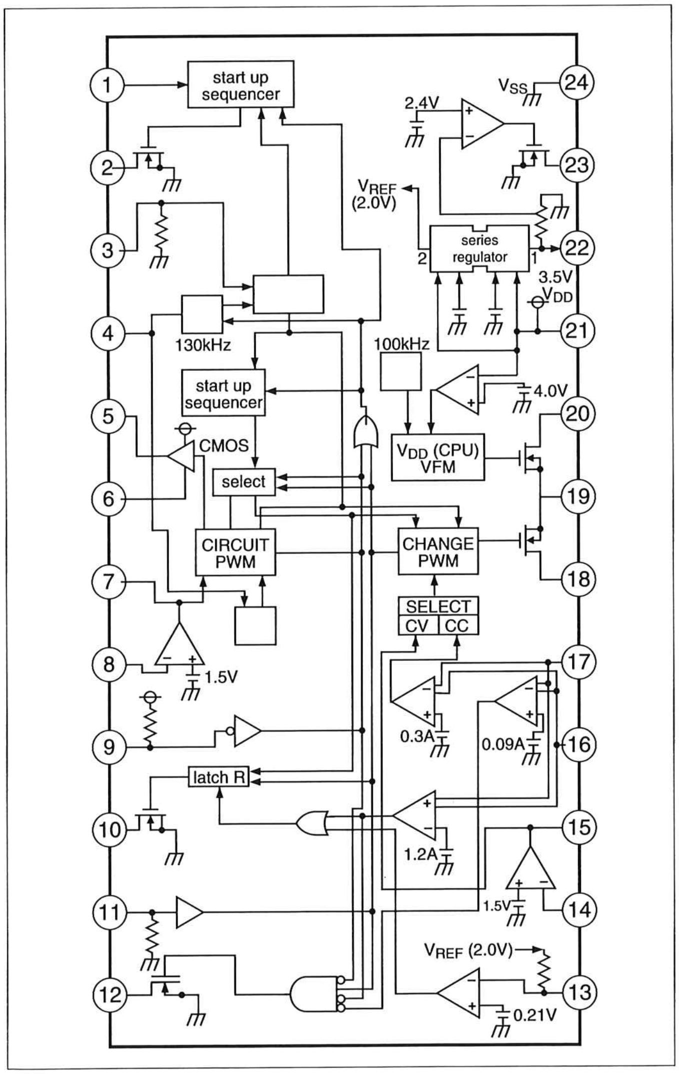
DC/DC MULTI-POWER SUPPLY

FEATURES

- **Step-up, step-down, and inverting DC/DC converters can be easily designed by combining the TC20 with coils, capacitors and diodes.**
- **Low current consumption .... 25µA (Typ., standby)**
- **High efficiency .... 70% to 80%**
  (Typ., depends on circuit configuration)
- **High accuracy output voltage .... ±5%**
- **Low temperature drift .... ±100ppm/°C**
- **Package .... 24-pin SOP**

FUNCTIONAL BLOCK DIAGRAM



APPLICATIONS

- **Voltage control for video equipment, laptop computers, and other battery-operated equipment.**

GENERAL DESCRIPTION

The TC20 is a power circuit controller IC containing three Tough CMOS™ process DC/DC converter control circuit systems (two ON-time control PWM systems and one OFF-time control VFM system). With additional components, the TC20 can configure three SWR systems to generate the CPU power supply voltage, charging voltage, or circuit power supply voltage from AC adapters, dry batteries, or rechargeable batteries. Furthermore, the TC20 has the following six functions:

1. With the built-in power supply voltage detector, the TC20 outputs low voltage alarms for dry or rechargeable batteries for the CPU power supply. (Alarms for batteries are output in frequencies. A V/F converter converts the voltages in the frequencies.)
2. The TC20 controls the charging of rechargeable batteries by an AC adapter output. The batteries are charged by a constant current initially, then by a constant current after the upper limit voltage is reached. The values for the constant current and voltage are specified externally. While the batteries are being charged, the TC20 provides charge indication signals. Upon detection of a low charge current, the TC20 shuts down.
3. To protect the charge system, the TC20 detects and latches output overcurrents and set heating (an diode must be added externally) and sends alarms. The alarms are released at the rising edge of charge control input signals.
4. The power saving function turns off the circuit power supply voltage generator.
5. The TC20 can be soft-started to prevent rush current occurring when the output in the circuit or charge system rises.
6. The TC20 can operate based solely on the internal clock. After self-activation, external sync clocks can be input.

TelCom Semiconductor, Inc.

TC18C46/7
TC28C46/7
TC38C46/7

CMOS CURRENT MODE PWM CONTROLLER

FEATURES

- Isolated Output Drive
- Low Power CMOS Construction
- Low Supply Current .... 2 mA Typ
- Wide Supply Voltage Operation .... 8V to 18V
- Latch-Up Immunity ....500 mA on Outputs
- Above and Below Rail Input Protection 6V
- High Output Drive .... 500 mA Peak
- Current Mode Control
- Fast Rise/Fall Time .... 50 ns @ 1000 pF
- High Frequency Operation .... 500 kHz
- UV Hysteresis Guaranteed
- Programmable Current Limit
- Shutdown Pin Available
- Double Ended
- Soft Start
- Low Prop Delay Current Amp to Output .... < 350 ns Typ
- Low Prop Delay Shutdown to Output .... < 400 ns Typ
- TC38C46/47 Pin Compatible with Unitrode UC3846/3847
- ESD Protected .... ±2 kV

GENERAL DESCRIPTION

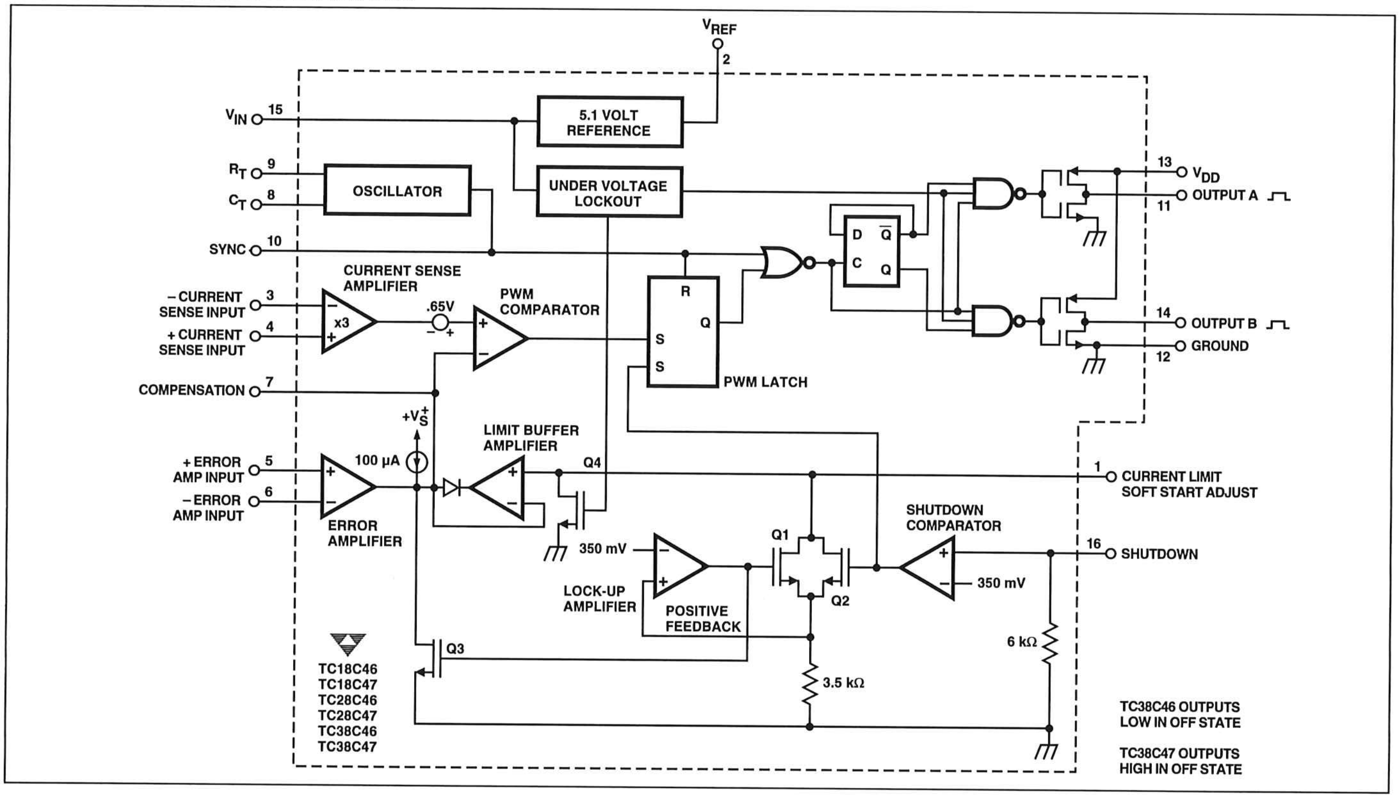
The TC38C42/3/4/5 are current mode BiCMOS PWM control ICs. A low 1.0 mA supply current along with the high drive currents (0.7A peak) allows the device to provide a low cost solution for a PWM that operates to 500 kHz and directly drives MOSFETs up to HEX 3 size.

Performance of the oscillator and current sense amplifier have been greatly improved over previous bipolar versions. Voltage and temperature stability have been improved by a factor of 3. Noise immunity (PSRR) has also been improved. These improvements make for a more reliable power system.

Tough CMOS™ design and construction provide input and output latch protection, outstanding ESD tolerance, and high reliability manufacturing techniques and materials. Tough CMOS™ means high reliability.

The TC38C42/3/4/5 are pin compatible with earlier bipolar versions so that designers can easily update older designs. Improvements have also been added. For example, clock ramp reset current is specified at 2.5 mA (±10%) for accurate dead time control. A few component values must be changed (R_T & C_T) to use TC38C42 family in existing bipolar designs.

FUNCTIONAL BLOCK DIAGRAM



VOLTAGE DETECTOR

FEATURES

- **High Precision** .... **±2.5%**
  (±1% Semi-custom version)
- **Surface Mount Package** **SOT-23-5, SOT-89**
  Through-Hole Package **TO-92**
- **Low Current Consumption** .... **1μA (V_{DD}=3V)**
- **Voltage Detection Range** **1.1V-6.0V**
- **Operating Voltage Range** **1.5V-10.0V**
- **Detected Voltage Temp Char** .... **±100ppm**
- **High Reliability**
  - **ESD Protection**
  - **Latch-up-proof Construction**
- **Delay Circuit (Semi-custom version)**

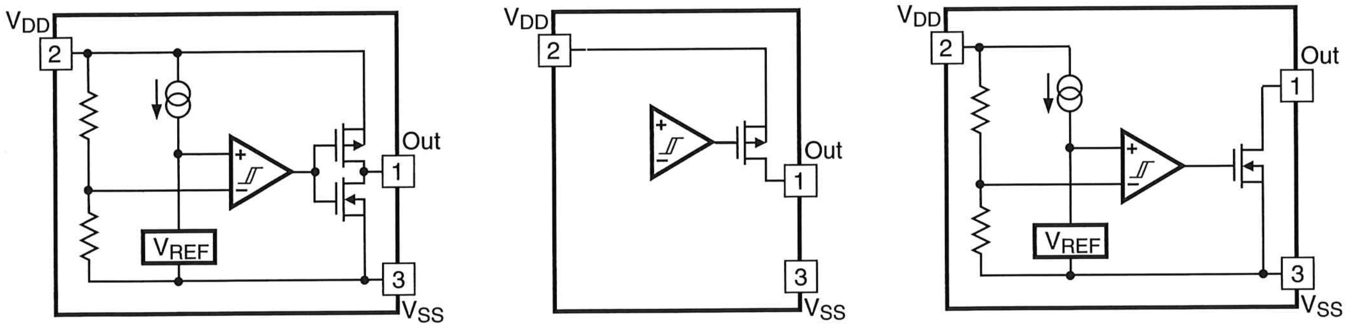
APPLICATIONS

- **Reset Circuit of Microcomputer & Logic Circuit**
- **Battery Checker**
- **Level Discriminator**
- **Waveform Shaping Circuit**
- **Switching Circuit for Battery Backup**
- **Power Failure Detector**

GENERAL DESCRIPTION

The TC44V Series of voltage detectors are designed to accurately detect a designated voltage for a wide variety of applications. These voltage detectors are especially suited for battery-powered portable applications due to the extremely low 1 μA operating current and small surface mount packaging. Each part is laser programmed to the desired voltage. They can be ordered with a voltage range of 1.5V to 10.0V in 0.1V steps. The circuit design consists of a low current high-precision voltage reference, comparator, hysteresis circuit and an output driver. For added versatility, the output circuit can be ordered with either an open drain output or a CMOS output. The TC44V series outputs remain in the logic HIGH state as long as V_{DD} is greater than the specified trip point voltage. When V_{DD} (plus the hysteresis voltage) falls below the specified trip point voltage, the output is driven to a logic LOW. The TC44V series of voltage detectors are available in SOT-23-5 and SOT-89 surface mount packages, and a TO-92 through-hole package.

FUNCTIONAL BLOCK DIAGRAM



CMOS Output

P-Channel Open Drain

N-Channel Open Drain

TC44LV Series

VOLTAGE DETECTOR

FEATURES

- Extremely low power consumption .... Typ 0.5µA (V_{DD} = 1.5V)
- Wide operation voltage range .... 0.7V ~ 10.0V
- Variety of detect voltage range .... 0.1V steps from 0.9V to 3.0V
- High accuracy voltage detection .... ±2.5%
- Low temperature coefficient of detect voltage .... Typ ±100 ppm/°C
- Output options .... N-Channel Open drain, CMOS
- Extremely compact package .... SOT-23-5 (Mini mold 5 pin)

APPLICATIONS

- Reset circuit of microcomputer and logic circuit
- Battery checker
- Level discriminator
- Waveform shaping circuit
- Switching circuit for battery backup
- Power failure detector

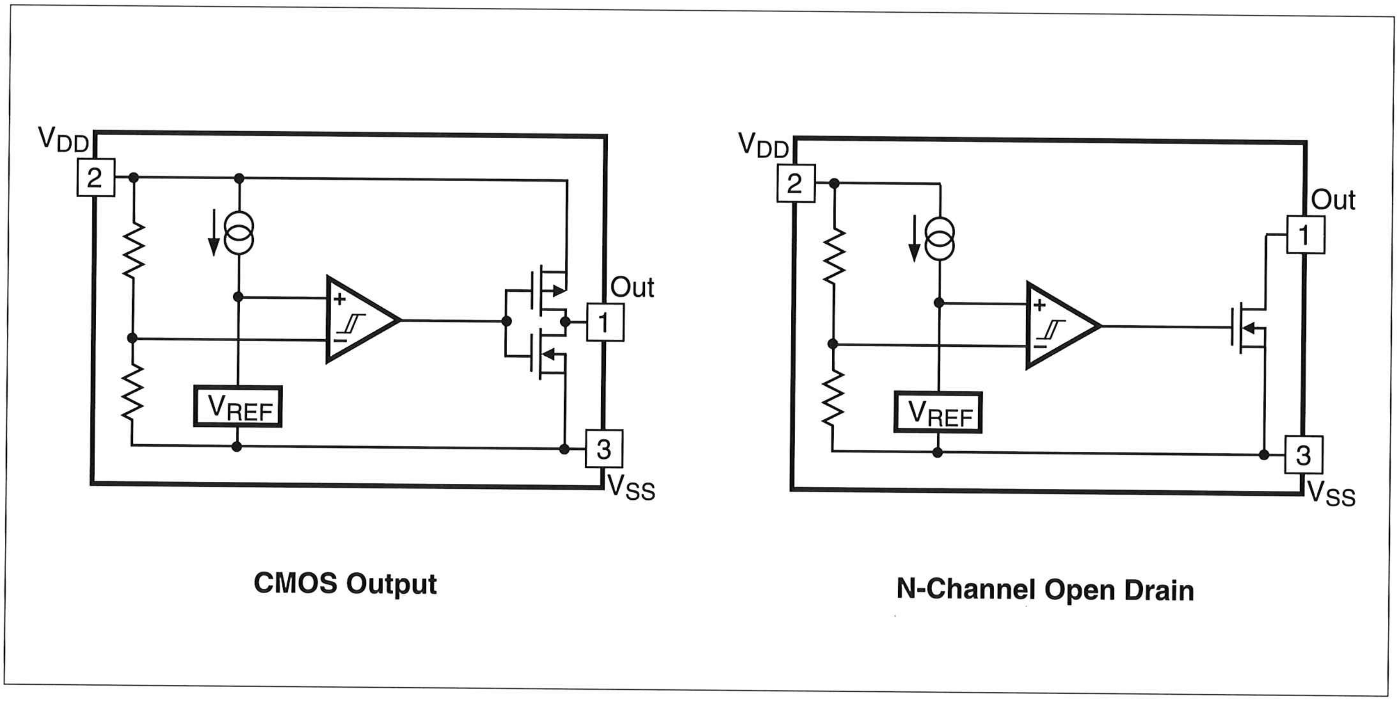
GENERAL DESCRIPTION

The TC44LV Series ICs are high-precision voltage detectors, developed using Tough CMOS™ process technology, featuring extremely low current consumption. The TC44LV Series ICs can be used for system resetting. The internal circuit consists of a reference voltage source, comparator, voltage detection resistance network, hysteresis circuit, and output drive transistor. The detection voltage is calibrated accurately inside the IC and requires no adjustment.

Two types of outputs are available: N-Channel open drain and CMOS.

The TC44LV Series can operate with a single battery (minimum operating voltage is 0.7V). Packaged in an ultra-compact 5-pin mini mold (SOT-23), the TC44LV Series ICs allow high-density mounting.

FUNCTIONAL BLOCK DIAGRAM



CMOS Output

N-Channel Open Drain

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VOLTAGE REGULATOR

FEATURES

- **Low Power CMOS**
- **Extremely Low Power Consumption ..... 1.1µA Typ**
- **Low Dropout Voltage .... 60mV @ 1mA Typ**
- **High Accuracy .... ±2.5%**
- **Output Voltage Range .... 2.0V ~ 6.0V**
- **Low Temp. Coefficient for Output Voltage .... ±100ppm/°C Typ**
- **Stable Input Rate 0.1%/V**
- **Variety of Output Voltage Levels .... 0.1V Steps**
- **Compact Package TO-92, SOT-89**

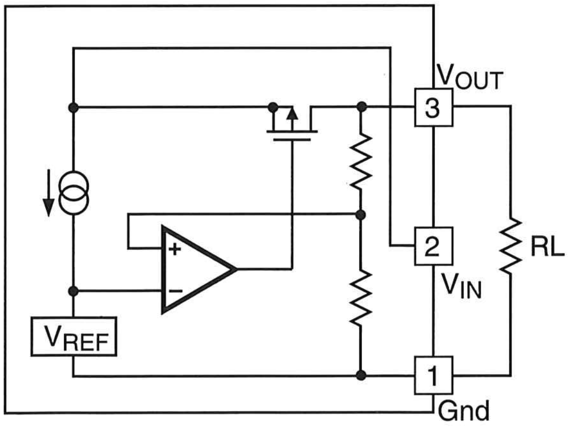
APPLICATIONS

- **Constant-voltage power supply for battery-powered devices**
- **Constant-voltage power supply for communications, and video equipment**
- **Stable standard voltage supply**

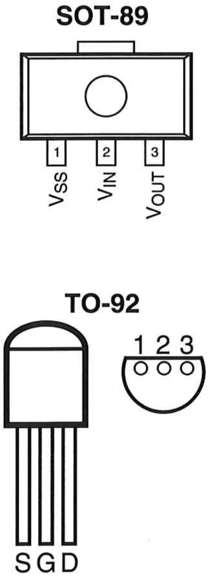
GENERAL DESCRIPTION

The TC45R Series, developed using Tough CMOS™ process technology, are highly accurate, low-power-consumption, fixed three-terminal voltage regulators. They include a reference voltage supply, error amplifier, control transistor, and resistor network which controls the output voltage. The output voltage is fixed in the device. The TC45R series is available in two different types of packages: SOT-89 and TO-92.

FUNCTIONAL BLOCK DIAGRAM



PIN CONFIGURATION



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TC45ER Series

VOLTAGE REGULATOR

FEATURES

- **Low Power CMOS**
- **Extremely Low Power Consumption ..... 1.1μA Typ**
- **Dropout Voltage .... .0.5V Typ at 60mA**
- **Large Output Current .... 120mA Typ**
- **High Accuracy .... ±2.5%**
- **Low Temp. Coefficient for Output Voltage .... ±100ppm/°C Typ**
- **Stable Input Rate .... 0.1%/V Typ**
- **Variety of Output Voltage Levels .... 0.1V Steps**
- **Compact Package TO-92, SOT-89**

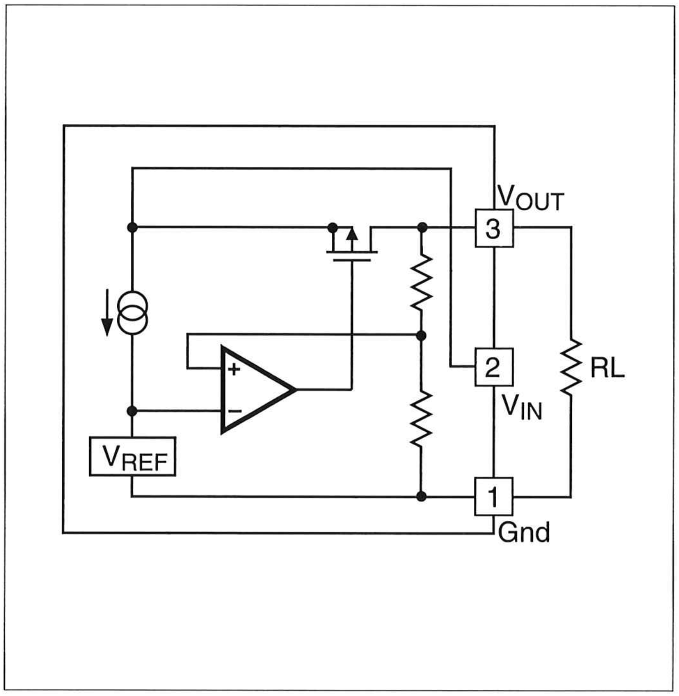
APPLICATIONS

- **Constant-voltage power supply for battery-powered devices**
- **Constant-voltage power supply for communications, and video equipment**
- **Stable standard voltage supply**

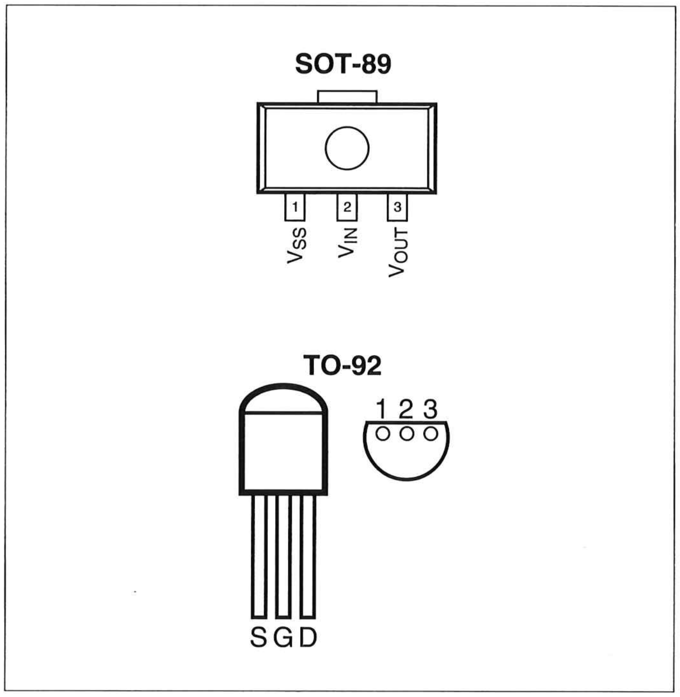
GENERAL DESCRIPTION

The TC45ER Series, developed using Tough CMOS™ process technology, are highly accurate, low-power-consumption, large output current 3-terminal voltage regulators. They include a reference voltage supply, error amplifier, control transistor, and resistor network to control the output voltage. Because of the low dropout voltage, an effective constant-voltage power supply can be designed. The TC45ER Series has a current control circuit to protect from destruction due to over current. The output voltage is fixed in the device. These regulators are available in two different packages: SOT-89 and TO-92.

FUNCTIONAL BLOCK DIAGRAM



PIN CONFIGURATION



TC45LR Series

VOLTAGE REGULATOR

FEATURES

- **Low Power CMOS**
- **Extremely Low Power Consumption ..... 1.1µA Typ**
- **Low Dropout Voltage ....30mV typ at 1mA**
- **Variety of Output Voltage Levels .... 0.1V steps**
- **High Accuracy .... ±2.5%**
- **Low Temp. Coefficient for Output Voltage .... ±100ppm/°C Typ**
- **Accurate Output Voltage .... ±2.5%**
- **Stable Input Rate ....0.1%/V Typ**
- **Compact Package .... SOT-23-5 Mini-Mold**

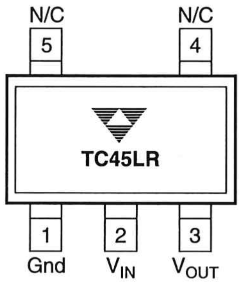
APPLICATIONS

- **Constant-voltage power supply for battery-powered devices**
- **Constant-voltage power supply for communications and video equipment**
- **Stable standard voltage supply**

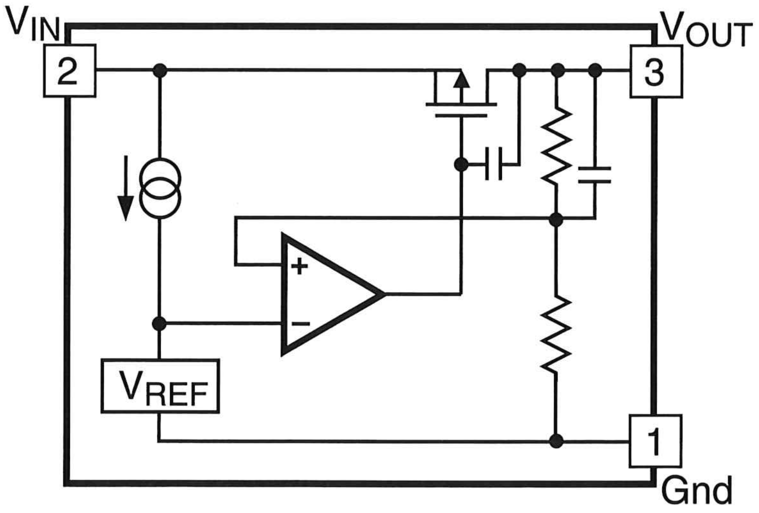
GENERAL DESCRIPTION

The TC45LR Series, developed with Tough CMOS™ process technology, are highly accurate, low-power-consumption, voltage regulators which include a reference voltage supply, error amplifier, control transistor, and resistor network to control the output voltage. The output voltage is fixed in the TC45LR device. These regulators are available in a small SOT-23-5 surface mount package.

PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



TC54V Series

VOLTAGE DETECTOR

FEATURES

- **High Precision** .... ±2% (±1% Semi-custom version)
- **Low Current Consumption** .... 1µA (V_{DD}=2V)
- **Voltage Detection Range** 1.1V-6.0V
- **Operating Voltage Range** 1.0V-6.0V
- **Detected Voltage Temp Char** .... ±100ppm
- **High Reliability**
  - **ESD Protection**
  - **Latch-up-proof Construction**
- **Delay Circuit (Semi-custom version)**
- **Package Options** .... **SOT-23 Surface Mount**
  SOT-89 Surface Mount
  TO-92 Through-hole Package

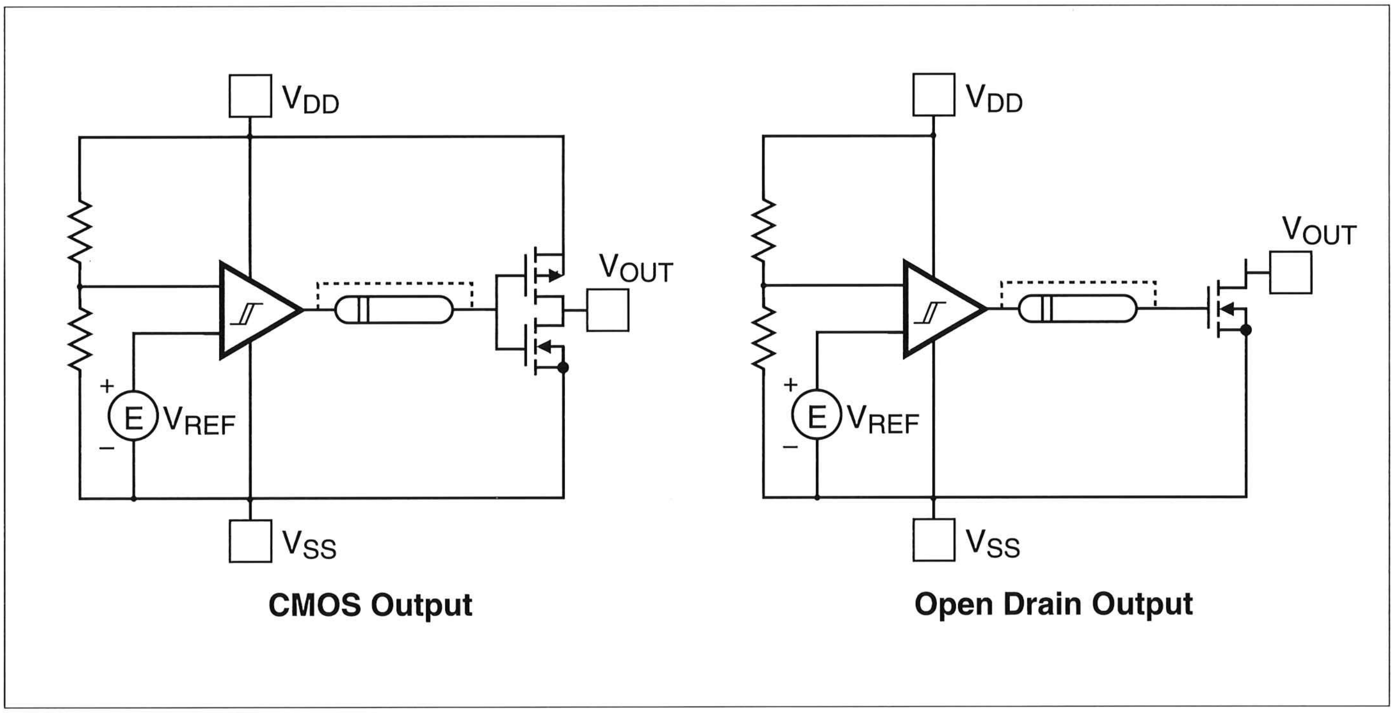
APPLICATIONS

- **Microcomputer Reset Generation**
- **System Brownout Detection**
- **Timing Delays**
- **Battery Voltage Monitoring**
- **Level Shifting**

GENERAL DESCRIPTION

The TC54V series of voltage detectors are designed to accurately detect a designated voltage for a wide variety of applications. These voltage detectors are especially suited for battery-powered portable applications due to the extremely low 1 µA operating current and small surface mount packaging. Each part is laser programmed to the desired voltage. They can be ordered with a voltage range of 1.1V to 6.0V in 0.1V steps. The circuit design consists of a low current high-precision voltage reference, linear delay circuit, comparator, hysteresis circuit and an output driver. The delay circuit is available with four different delay ranges from 0 msec to 500 msec in 100 msec steps. For added versatility, the output circuit can be ordered with either an open drain output or a CMOS output. The TC54V series outputs remain in the logic HIGH state as long as V_{DD} is greater than the specified trip point voltage. When V_{DD} (plus the hysteresis voltage) falls below the specified trip point voltage, the output is driven to a logic LOW. The TC54V series of voltage detectors are available in surface mount packages SOT-23 and SOT-89 and a TO-92 through-hole package.

FUNCTIONAL BLOCK DIAGRAM



CMOS Output

Open Drain Output

TC55RP Series

LOW DROPOUT POSITIVE VOLTAGE REGULATOR

FEATURES

- **CMOS**
- **Very Low "Dropout" Voltage 120mV typ at 100mA**
  380mV typ at 200mA
- **High Output Current .... 250mA (V_{OUT}=5.0V)**
- **High Accuracy .... ±2%**
  (±1% Semi-custom Version)
- **Wide Output Voltage Range .... 1.1V~9.9V**
- **Low Power Consumption .... 1.1µA (V_{OUT}=5.0V)**
  (at NO LOAD)
- **Good Temperature Stability .... ±100ppm/°C Typ**
- **Good Voltage Regulation .... 0.1%/V Typ**
- **Package**
  Options .... SOT-23 (150mW) Surface Mount
  SOT-89 (500mW) Surface Mount
  TO-92 Through-hole Package

APPLICATIONS

- **Battery-Powered Devices**
- **Pagers and Cellular Phones**
- **Solar-Powered Instruments**
- **Portable Instruments**

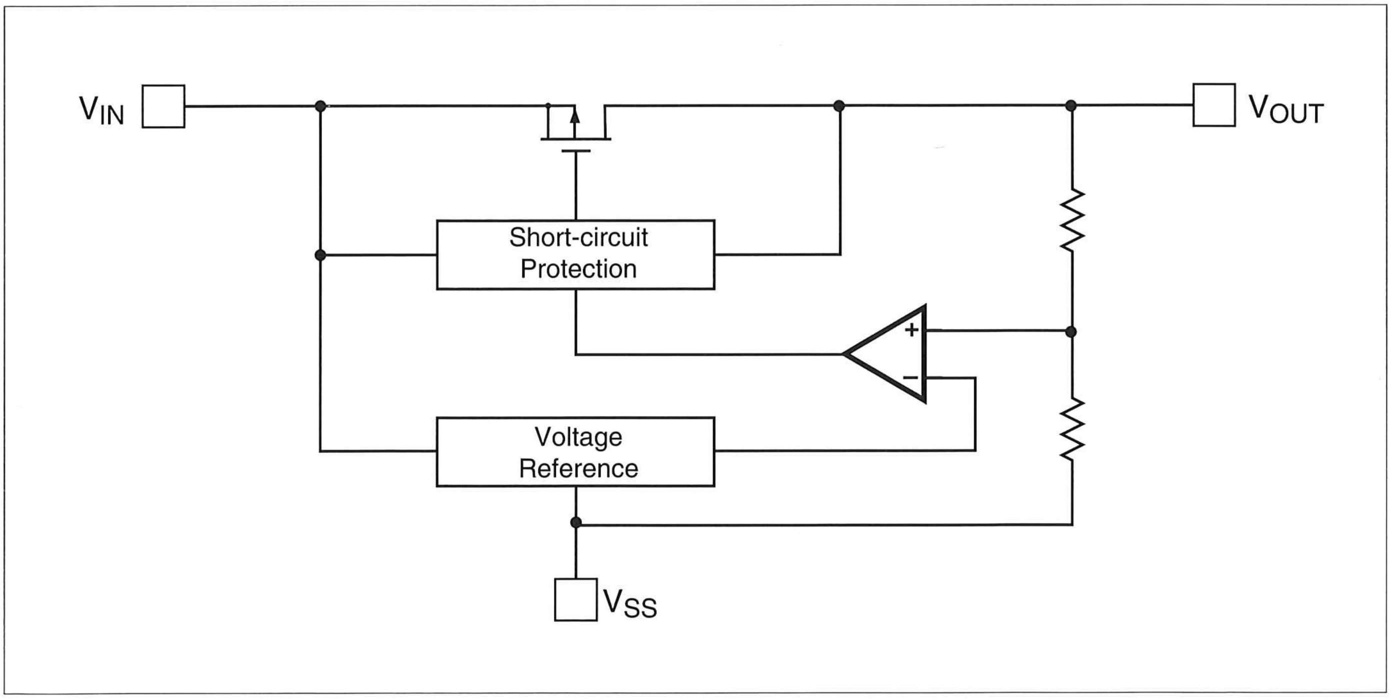
GENERAL DESCRIPTION

The TC55RP series is a collection of low dropout positive voltage regulators which can source up to 200mA of current with an extremely low input-output voltage differential of 380mV.

The low dropout voltage combined with the low current consumption of only 1 µA makes this part ideal for battery operation. The low voltage differential (dropout voltage) allows for longer battery operating lifetime. For example, for a 100mA application, the battery can drop to 5.12V and still supply a regulated 5V output. The circuit also incorporates short-circuit protection to ensure maximum reliability.

The TC55RP series of voltage regulators are available in standard outputs of 5.0V, 4.0V and 3.0V. Additional voltages can be custom ordered from 1.1V to 9.9V. The regulators are available in SOT-23 (150mW), SOT-89 (500mW) surface mount packages and a TO-92 through-hole package.

FUNCTIONAL BLOCK DIAGRAM



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TC55RN Series

LOW DROPOUT NEGATIVE VOLTAGE REGULATOR

FEATURES

- CMOS
- Very Low "Dropout" Voltage .... 120 mV Typ @ 50 mA
  380 mV Typ @ 100 mA
- High Output Current .... 100 mA (V_{OUT} = –5.0V)
- High Accuracy .... ±2%
  (±1% Semi-custom Version)
- Wide Output Voltage Range:.............–2.1V ~ –9.9V
  (at 0.1V step)
- Low Power Consumption .... 3.0 µA
  (V_{IN} = –10.0V), (V_{OUT}) = –5.0V) at No Load
- Good Temperature Stability .... ±100ppm/°C typ
- Good Voltage Regulation ....0.1%V Typ
- Package Options .... SOT-23 (150mW) Surface Mount
  SOT-89 (500mW) Surface Mount
  TO-92 Through-hole Package

APPLICATIONS

- Battery-Powered Devices
- Cameras and Portable Video Equipment
- Pagers and Cellular Phones
- Portable Instruments
- Solar-Powered Instruments

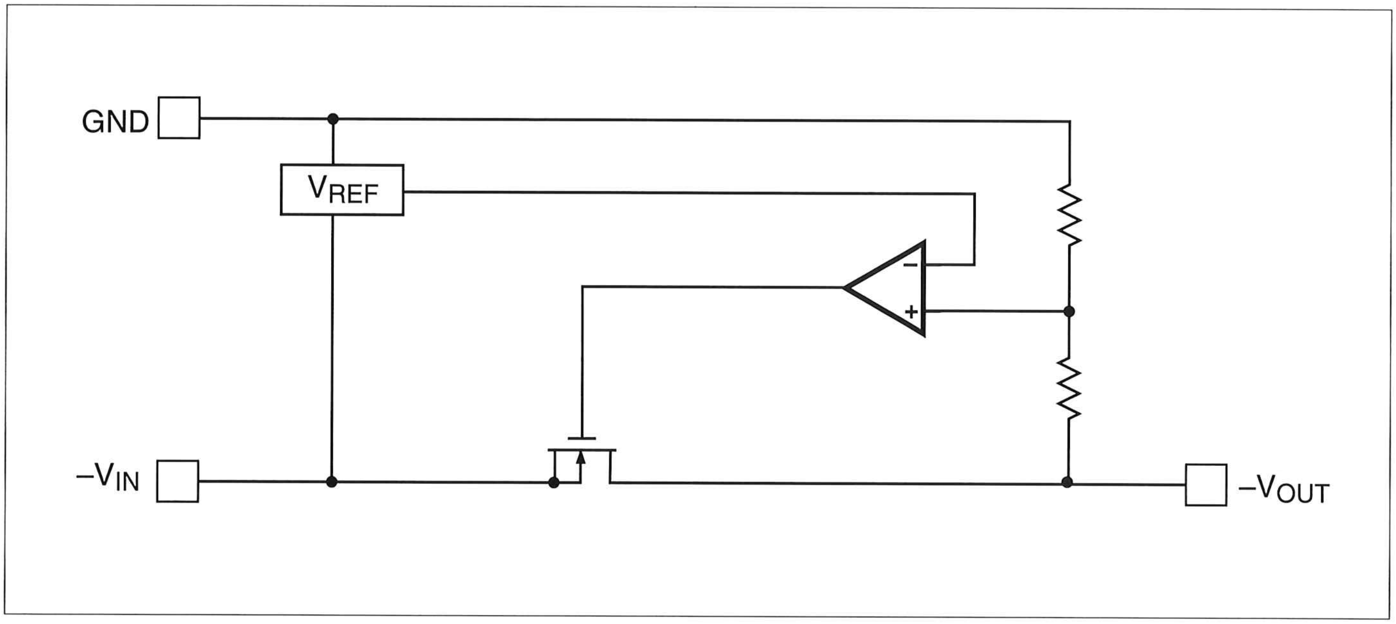
GENERAL DESCRIPTION

The TC55RN Series is a collection of low dropout negative voltage regulators which can source up to 100 mA of current with an extremely low input-output voltage differential of 380 mV. A high accuracy reference voltage source, error amplifier and output driver are the main elements of the regulators.

Because of a small input/output voltage differential, the TC55RN can reduce power-loss and is also available in high transformation efficiency. Furthermore, the TC55RN can handle higher output current within the limits of power dissipation by allowing an increased input/output voltage differential.

The TC55RN Series of voltage regulators are available in standard outputs of 5.0V, 4.0V and 3.0V. Additional voltages can be custom ordered from 1.1V to 9.9V. The regulators are available in SOT-23 (150mW), SOT-89 (500mW) surface mount packages and a TO-92 through-hole package.

FUNCTIONAL BLOCK DIAGRAM



TC96C555

3A OUTPUT PROGRAMMABLE POWER OSCILLATOR

FEATURES

- Controllable Duty Cycle
- Wide Operating Range .... 5V to 18V
- High Peak Output Current 3A
- High Capacitive Load Drive
  Capability .... 1800pF in 20ns
- Short Delay Time .... <150ns Typ

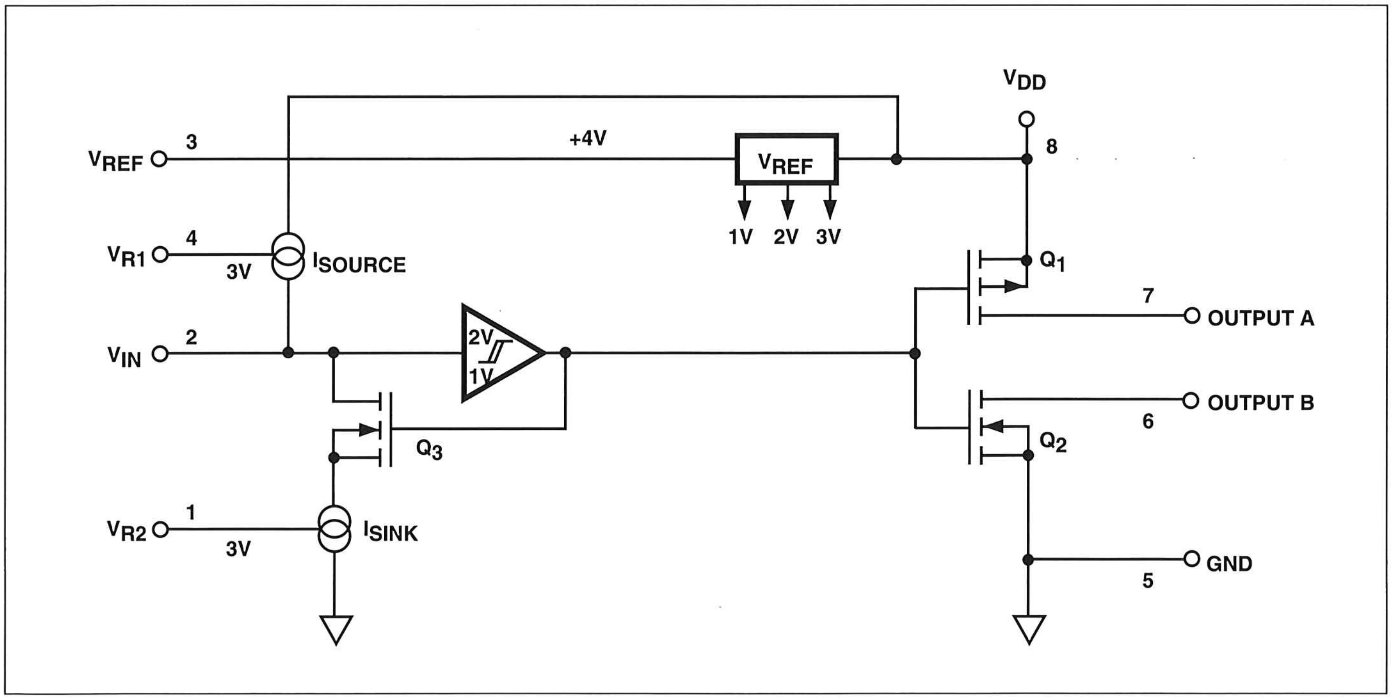
APPLICATIONS

- Fixed Frequency Power Oscillator
- Voltage Control Oscillator with Power Drive
- Low Power Buck Regulator Supply
- MOSFET Driver

GENERAL DESCRIPTION

The TC96C555 Programmable Power Oscillator IC uses TelCom Semiconductors' Tough CMOS™ process. The output drive capability is similar to the TC4423/4/5 MOSFET Drivers which can switch in 25ns into a capacitive load of 1,800pF. The TC96C555 will not latch up under any conditions within their power and voltage ratings. They can accept, without damage, up to 1.5A of reverse current (of either polarity) being forced back into the output. All terminals are ESD protected up to 4kV. The peak drive output is rated at 3A. Split outputs permit the driving of an external pair of MOSFETS with controllable cross conduction between upper and lower MOSFET devices.

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

TC176
TC177

BiCMOS PWM CONTROLLERS

FEATURES

- **Low Power BiCMOS Construction**
- **Low Supply Current at 20 kHz .... 1.0 mA Typ**
- **Latch Up Immunity................> 500 mA on Outputs**
- **Below Rail Input Protection .... –5V**
- **High Output Drive .... 500 mA Peak**
- **Fast Rise/Fall Time .... 50 ns @ 1000 pF**
- **High Frequency Operation .... Up To 1 MHz**
- **UV-Pin Available**
- **Undervoltage Hysteresis Guaranteed**
- **Shutdown Pin Available**
- **Double Ended**
- **Soft Start, With Small Cap**
- **Low Prop Delay Shutdown to Output .... 140 ns Typ**

GENERAL DESCRIPTION

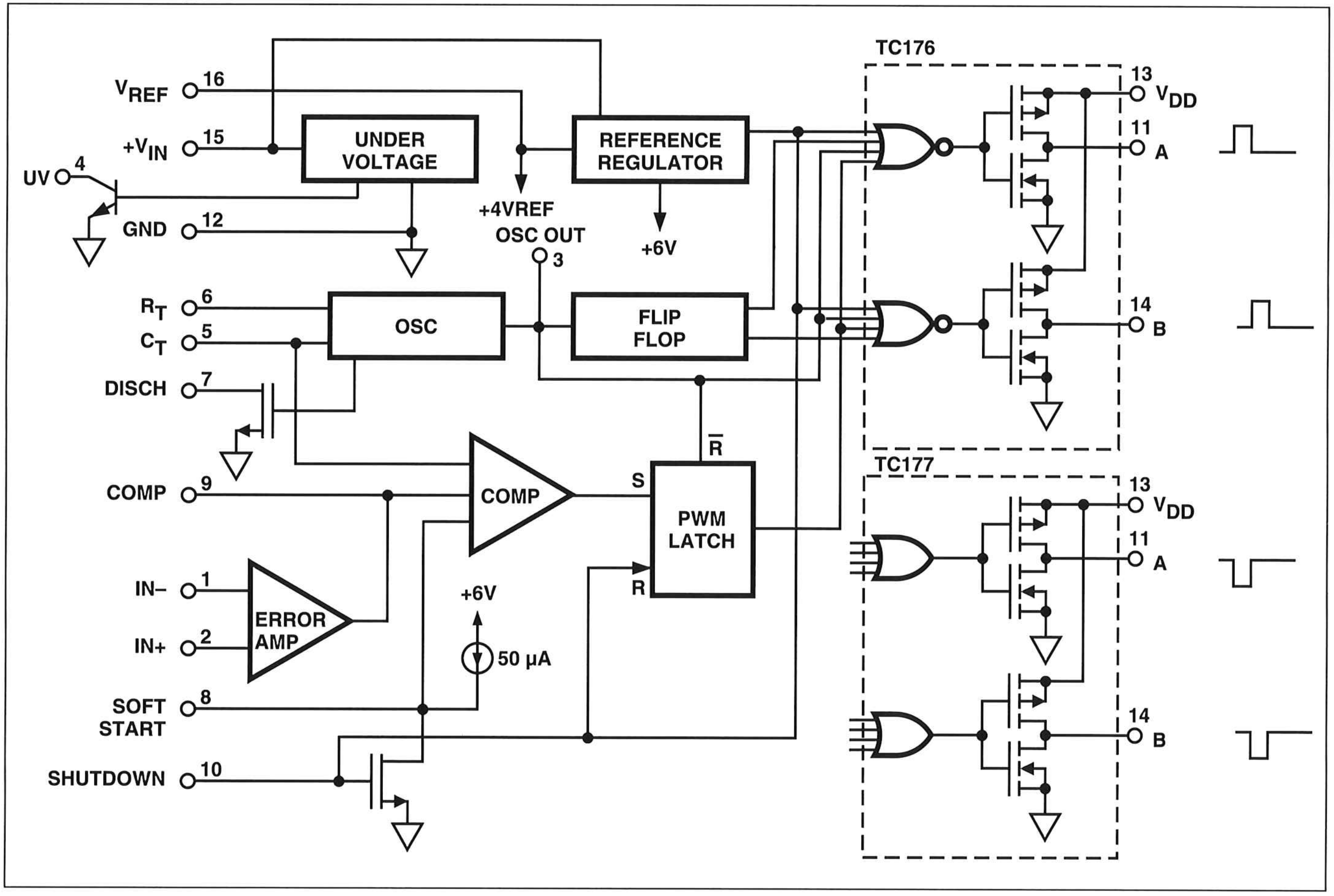
The TC176 and TC177 family is a variation of the TC35C25. The SYNC pin 3 of TC35C25 is used as an undervoltage indicator output on the TC176/7.

These second generation CMOS devices employ TelCom Semiconductors' Tough BiCMOS™ process for latch-up proof operation. They offer much lower power consumption than any of their previous CMOS or bipolar counterparts.

These controllers have separate supply pins for the control and output sections of the circuit. This allows 'boot-strap' operation. The CMOS output stage allows the output voltage to swing to within 25 mV of either rail.

Other improved features include tighter hysteresis and undervoltage start-up specifications over temperature, and very low input bias current on all inputs.

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

TC385-1.2V
TC385-2.5V

LOW POWER, BAND-GAP VOLTAGE REFERENCES

FEATURES

- Temperature Coefficient .... 100 ppm/°C
- Wide Operating Current Range
  - TC385-1.2V .... 15 µA to 20 mA
  - TC385-2.5V .... 20 µA to 20 mA
- Dynamic Impedance 1Ω
- Output Tolerance .... ±2%
- Output Voltage Option
  - TC385-1.2V 1.25V
  - TC385-2.5V 2.5V
- TO-92 Plastic Package
- 8-Pin Plastic Small Outline (SO) Package

APPLICATIONS

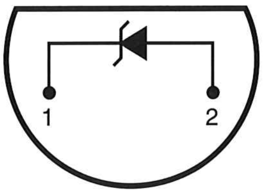
- ADC and DAC Reference
- Current Source Generation
- Threshold Detectors
- Power Supplies
- Multimeters

GENERAL DESCRIPTION

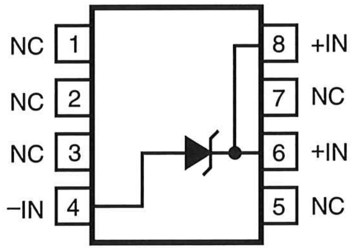
The TC385-1.2V (1.25V output) and TC385-2.5V (2.5V output) bipolar, two-terminal, band-gap voltage references offer precision performance without premium price. These devices do not require thin-film resistors, greatly lowering manufacturing complexity and cost.

A 100 ppm/°C output temperature coefficient and 15 µA to 20 mA operating current range make these devices attractive for multimeter, data acquisition converter, and telecommunication voltage references.

PIN CONFIGURATIONS



TO-92
PLASTIC PACKAGE
(BOTTOM VIEW)



SURFACE MOUNT
PLASTIC PACKAGE

NC = NO INTERNAL CONNECTION

TelCom
Semiconductor, Inc.

16-BIT SERIAL INTERFACE CONTROLLER FOR TC500 AND TC500A

FEATURES

- **Up to 16-Bits of Resolution**
- **Independent Data Clock Rate**
- **Binary Data Output**
- **Programmable Conversion Rate**
- **"Visible" Overrange Bit**
- **Double Buffered Data Latch**
- **On-Chip Oscillator Circuit**
- **Serial Data for Compact Circuits**
- **"Overrange" may be used as 17 Bit**
- **14-Pin DIP or 16-Pin SMD**
- **HiZ Output on D_{OUT} when not selected**

GENERAL DESCRIPTION

The TC520 Serial Interface Controller provides complete logic control for the TC500 or TC500A Analog Processors in a compact 14 or 16 pin package. The TC520 contains a programmable "Auto-Zero" and "Integrate" time, and 16-bit "results" counter. The TC520 controls the "A" and "B" inputs to the TC500A for each one of the four conversion phases.

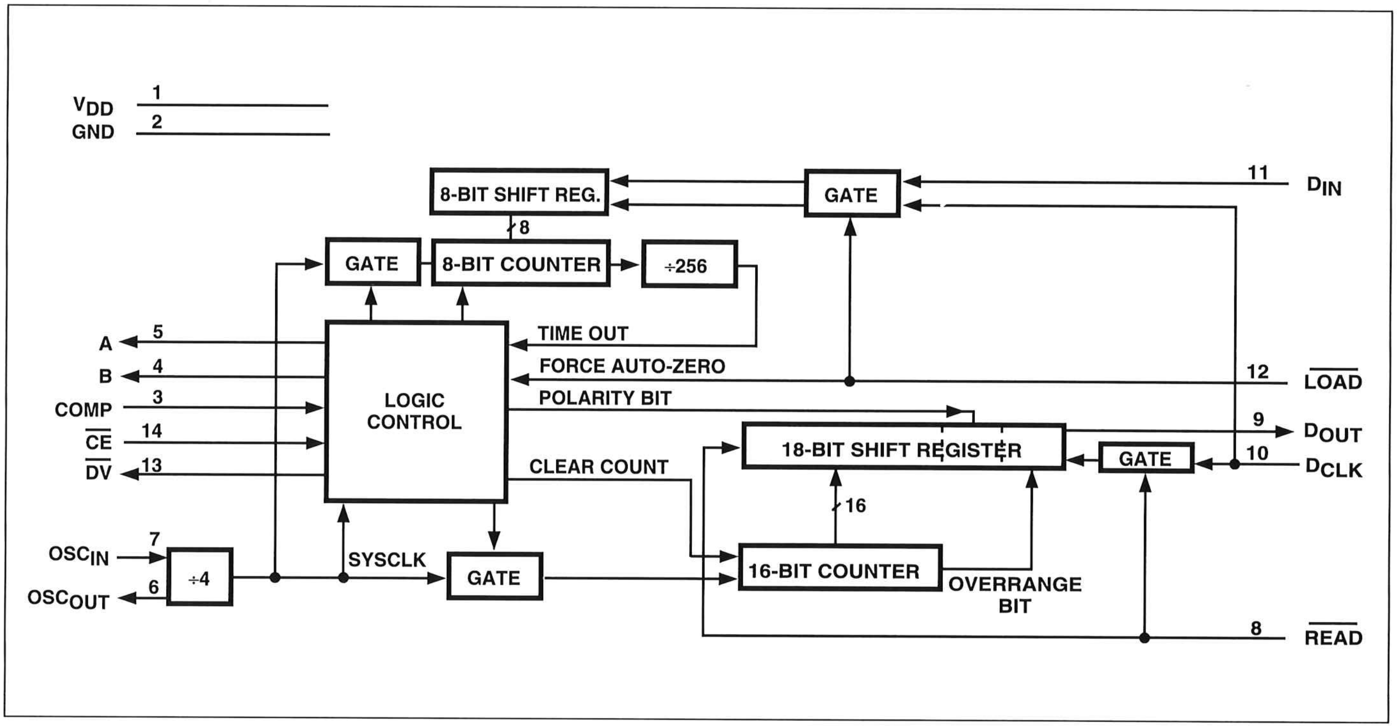
An 18-bit shift register holds the 16-bit conversion data plus the sign bit and overrange bit until it is read or until the next conversion has been completed. The shift register data will not update while data is being read from the TC520 although the TC500 will continue to convert. Some or all of this serial information may be clocked out at any time at whatever rate the user prefers.

The TC520 may operate from the system clock, its own external crystal, or any other appropriate source. The timing of the conversion phases of the TC500/A are determined by the TC520's frequency of operation and may be completely independent of the microprocessor clock rate.

The TC520 allows full flexibility of the TC500 or TC500A by providing programmable auto zero and integrate timing. The timing is determined by a 16-bit counter which is made up of an 8-bit counter (÷256) and an 8-bit multiplier (÷N) working in series. The TC520 supports multiple conversion rate applications by allowing the 8-bit multiplier to be modified under software control through a serial interface.

The CMOS TC520 operates from a single 5V supply. Power dissipation is less than 7.5mW.

FUNCTIONAL BLOCK DIAGRAM



NOTE: All electrical data is included for reference only. Values are subject to change without notice.

TelCom
Semiconductor, Inc.

TC625

SMART TEMPERATURE SENSOR

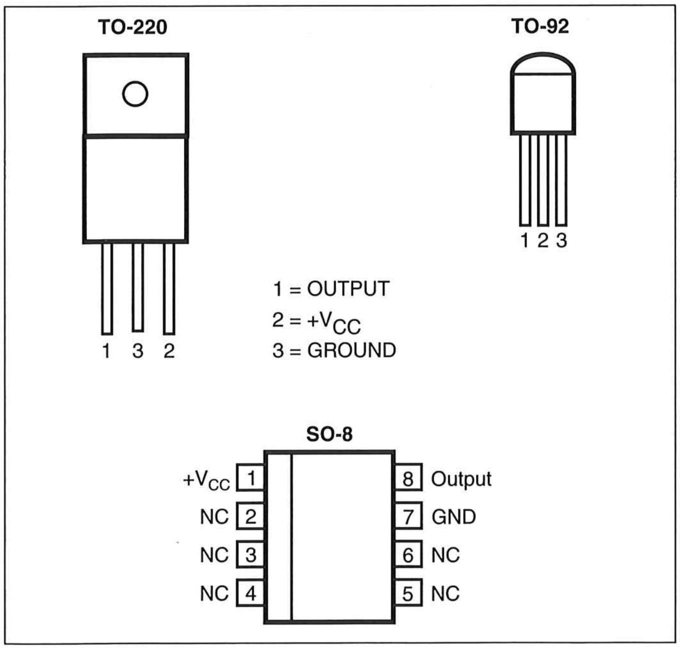
FEATURES

- No A/D Converter necessary
- High absolute accuracy .... ±1.2°C
- Linear output .... within 0.4°C
- Output fully digital interpretable
- Output fully analog interpretable
- Calibrated on chip
- TTL, CMOS compatible
- Temperature range .... 175°C (–45°C to +130°C)
- Can drive data input of microprocessor
- Easy multiplexing allows using several sensors with one microprocessor
- Low power consumption .... <1 mW
- Available in TO-92, TO-220 and 8-pin SOIC packages.

APPLICATIONS

- Heater systems
- Air conditioners
- Climatizing units
- Washing machines
- Overheating protection
- Appliances
- Personal computers
- Monitoring Sensitive Electronic Components

PIN CONFIGURATIONS



GENERAL DESCRIPTION

The TC625 is a three terminal integrated temperature sensor with a duty-cycle modulated output. Two terminals are used for the power supply of 5 volts and the third terminal carries the output signal. A duty cycle modulated output is used because this output is interpretable by a microprocessor without an A/D converter, while the analog information is still available.

The TC625 (TO-92 model) has an overall accuracy of 1.2°C in the range from –30°C to +100°C and an accuracy of 2.0°C from –45°C to +130°C. This makes the sensor especially useful in all applications where "human" (climate control, food processing, etc.) conditions are to be controlled.

The CMOS output of the sensor can drive cable length of up to 20 meters. This makes the TC625 very useful in remote sensing and control applications.

PRODUCT HIGHLIGHTS

The TC625 Smart Temperature Sensor represents a significant new development in transducer technology. Its new on-chip interface responds to the progressively stringent demands of both the consumer and industrial electronic sectors for a temperature sensor directly connectable to a microprocessor input and thus, capable of direct and reliable communication with microprocessors.

This sensor also features a duty-cycle modulated square-wave output voltage with a linear response to temperatures in the –45°C to +130°C range with an accuracy of better than 2°C. In the –30°C to +100°C range, the linearity is better than 0.4°C (TO-92).

The TC625 Sensor is calibrated during test and burn-in of the chip. The integral modulator ensures that the sensor unit can communicate effectively with low-cost processors without the need for expensive (on-board) A/D converters.

This sensor combines digital output and on-chip calibration to reduce cost and enhance performance.

Direct connection of the sensor output to the microprocessor input reduces the number of components and terminals to a minimum, cutting costs and boosting reliability.

In most multiple sensor applications, easy multiplexing can be obtained by using more microprocessor inputs or by using simple inexpensive multiplexers.

Since the sensor requires no subsequent calibration, optimal cost savings are realized both during manufacturing and in the course of after-sales servicing.

TelCom
Semiconductor, Inc.

TC650/650A/651/651A

STEP-UP DC/DC CONVERTER

FEATURES

- **TC650 .... 3V output, normal type**
  TC650A .... 3V output, low input voltage type
  TC651 .... 5V output, normal type
  TC651A .... 5V output, low input voltage type
- **Low quiescent current .... 2.5µA Typ.**
  (no step-up, TC650/650A)
- **Low voltage operation ...... Input voltage V_{IN} 0.9V**
  (TC650A/651A)
- **High efficiency .... 80% Typ.**
- **High output voltage accuracy .... ±5%**
- **Small temperature drift**
  of output voltage .... ±50ppm Typ.
- **Compact package SOT-89**
  (Mini Power Mold)

APPLICATIONS

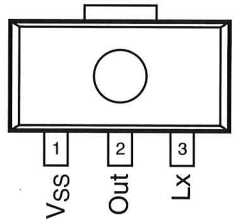
- **Constant voltage source for battery-operated devices**
- **Constant voltage source for communications equipment**
- **Local regulator for different operating voltages**

GENERAL DESCRIPTION

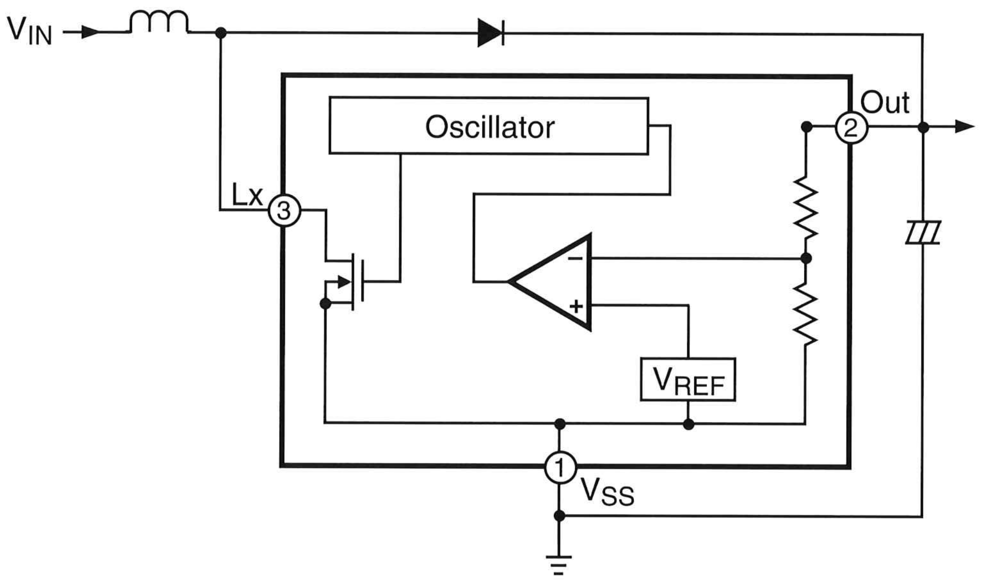
The TC650/650A/651/651A ICs are compact step-up DC/DC converter ICs, developed using TelCom's Tough CMOS™ process technology. They consist of reference voltage sources, error amplifiers, control transistors, oscillation circuits, and output voltage setting resistors. As external parts, a coil, a diode, and a capacitor are available for obtaining a constant output voltage (3V, 5V) higher than the input voltage.

The package is a compact three-terminal mini power mold type.

PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

STEP-UP/STEP-DOWN DC/DC CONVERTER

FEATURES

- **TC652 .... Output voltage 3V Typ.**
  TC653 .... Output voltage 5V Typ.
- **Low invalid current .... 4.0µA Typ.**
  (No step-up, TC652)
- **Small invalid current........ Input voltage VIN ≥ 1.2V**
  (No Load)
- **High efficiency .... 70% Typ., step-up**
- **High output voltage accuracy .... ±5%**
- **Small temp. drift of output voltage . ±100ppm Typ.**
- **Small package .... 8-Pin SOP**

APPLICATIONS

- **Constant voltage source for battery-operated devices**
- **Constant voltage source for communications equipment**
- **Local regulator for different operating voltages**

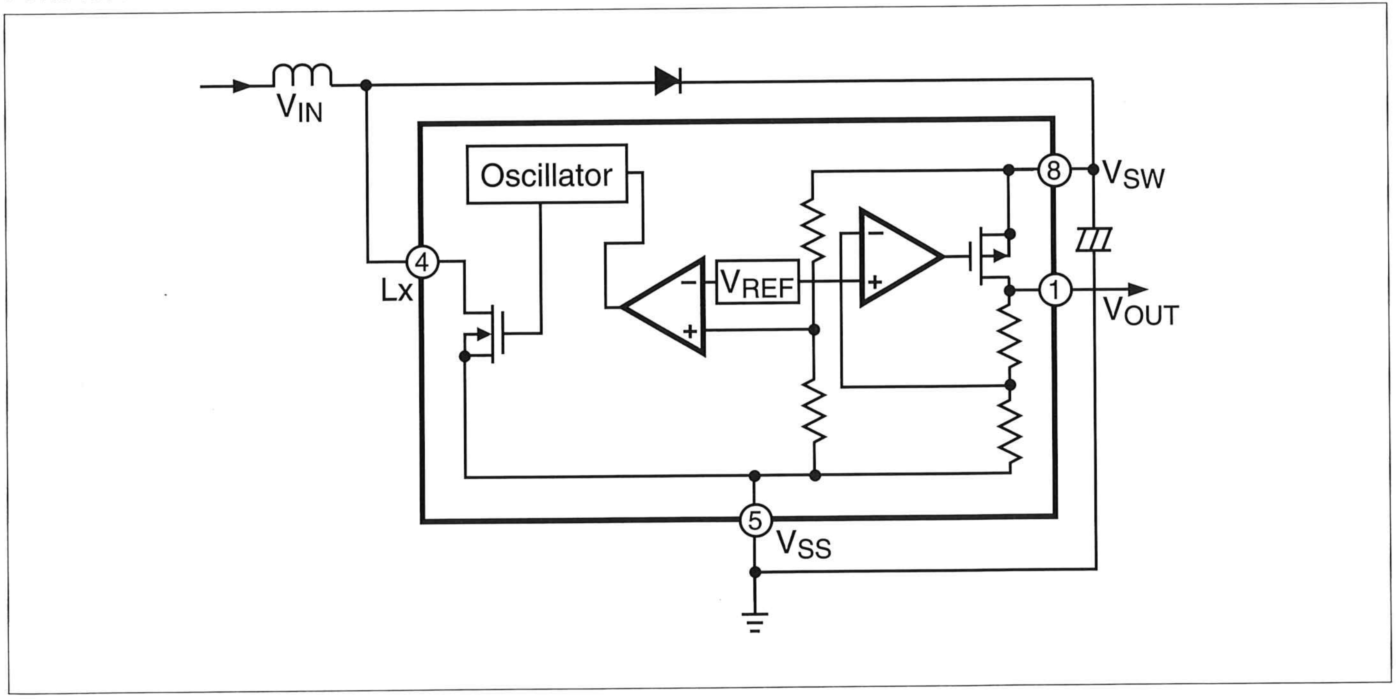
GENERAL DESCRIPTION

The TC652/653 ICs are compact DC/DC Converter ICs, developed using TelCom's Tough CMOS™ process technology. When the input voltage is sufficiently high, they work as series regulators. When the input voltage drops, they work as step-up switching regulators.

They consist of a step-up switching regulator circuit and series regulator circuit. The switching regulator circuit consists of the reference voltage source, error amplifier, control transistor, oscillation circuit, and output voltage setting resistor. The series regulator circuit consists of the reference voltage source (shared with the switching regulator circuit), error amplifier, output transistor, and output voltage setting resistor.

As external parts, a coil, a diode, and a capacitor are available for making the output voltage constant even when the input voltage changes across the output voltage.

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

REGULATED DC-DC CONVERTER

FEATURES

- **Compact, Integrated Power Conversion Solution:**
  - **Linear +5V Regulator**
  - **Charge Pump -5V DC-DC Converter**
- **Wide Input Voltage Range .... 5.5V to 12V**
- **Output Current .... 20 mA**
- **Low Dropout Linear Regulator .... 0.2V typ @ 20mA**
- **High Efficiency DC-DC Converter 98%**
- **Low Output Impedance 100Ω**
- **Low Supply Current .... 200 µA**
- **Shutdown Input .... 1 µA**
- **Short-circuit Protection**
- **Thermal Shut Down**
- **8-pin DIP or SO Package**

GENERAL DESCRIPTION

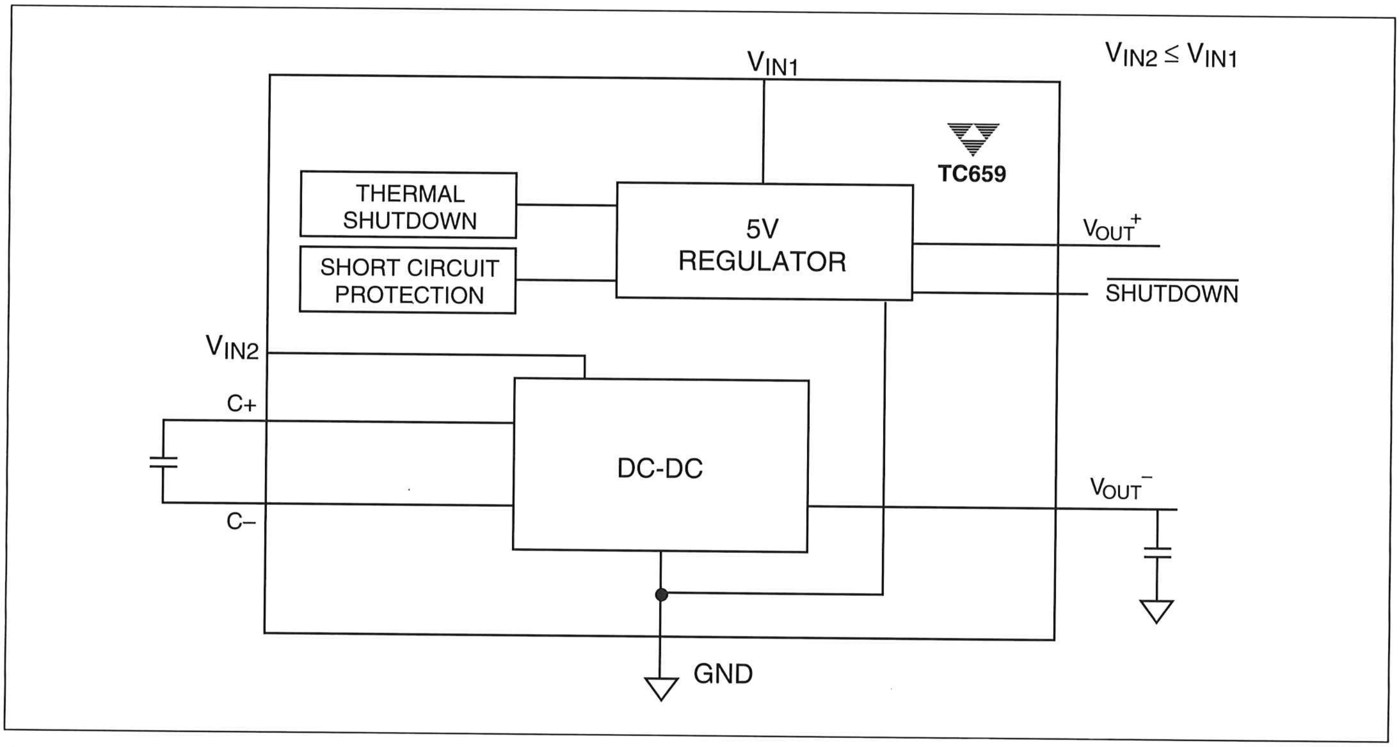
The TC659 is a power control integrated circuit which provides ±5V outputs from supplies V_{IN1} and V_{IN2}, respectively. The TC659 combines a low dropout (LDO) linear voltage regulator with a high efficiency DC-DC converter. An advanced BiCMOS process reduces supply current to only 200µA, while offering excellent voltage conversion and power conversion efficiency. The TC659 is ideal for powering LCD displays in battery powered applications such as cellular telephones, data acquisition systems, and portable instrumentation.

The TC659's linear regulator provides a fixed +5 volt output with up to 20mA of output current. The regulator operates down to 5.2V with a 20 mA load, which extends the operating life of battery powered systems.

The TC659 uses a switched capacitor DC-DC converter technique to provide a negative voltage from the V_{IN2}. The DC-DC converter has an output resistance of 100Ω. Power efficiency is typically 98% with a load current of 2mA.

Operating from an input voltage of 5.5V to 12V, the TC659 requires only 200µA of quiescent supply current. A shutdown pin reduces supply current to only 1µA. The TC659 is packaged in an 8-pin DIP or small outline (SO) package.

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

TC677
TC678

FAST NiCAD/Ni-HYDRIDE BATTERY CHARGER

FEATURES

- **Fast Charge Cycle**
- **Automatic Overcharge Protection**
- **Fail Safe Fast Charge Shut-Off**
- **Programmable Min/Max Ambient Limits**
- **Selectable Charge Rate**
- **Automatic Trickle Charge**
- **Forced Trickle Charge (TC677)**
- **Timer Reset Pin (TC678)**
- **Safety Features**
- **Temperature Controlled Shut-Off**
- **Time Controlled Shut-Off**
- **Dual Mode Automatic Shut-Off**
- **Automatic Battery Insertion Detector**

APPLICATIONS

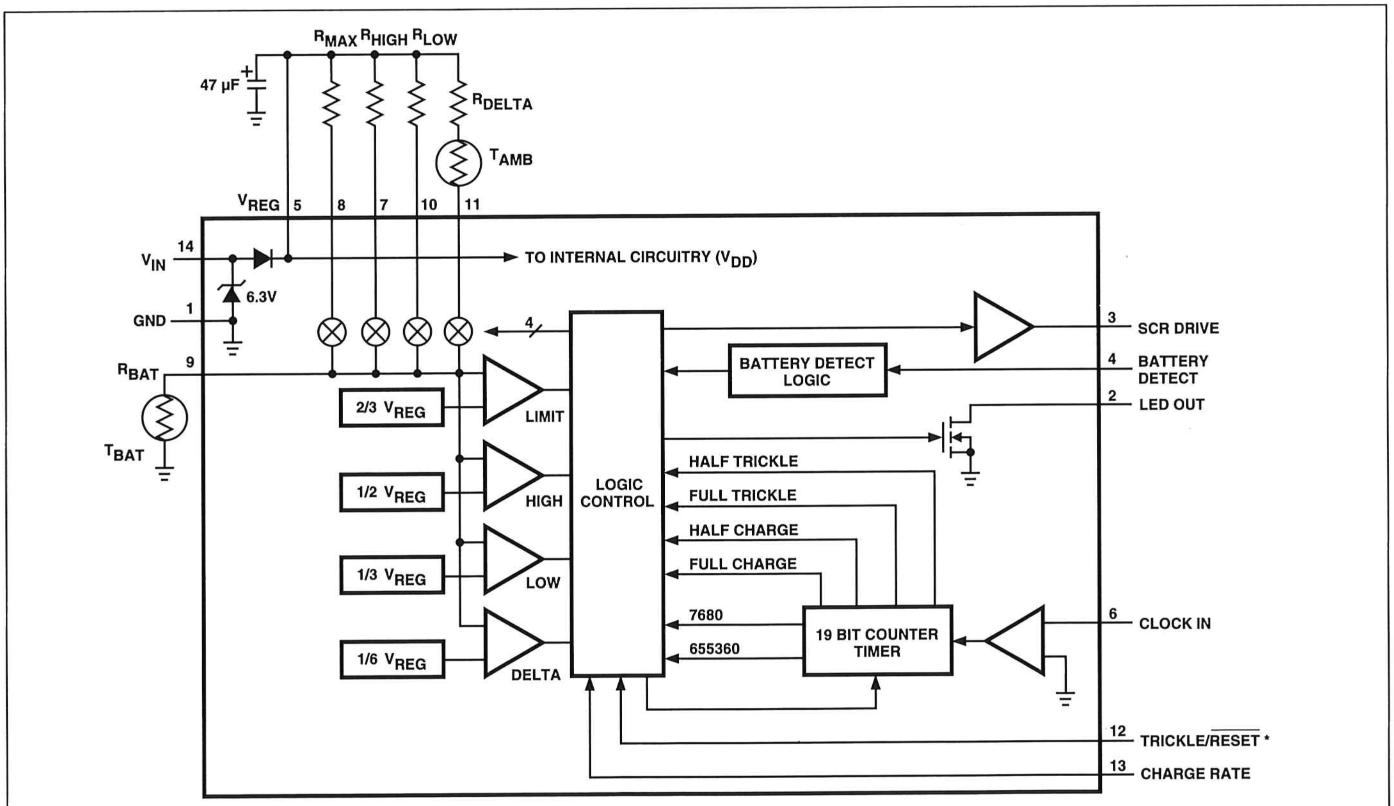
- **Battery Powered Applications**
  —Power Tools
  —Laptop/Notebook Computers
  —Medical
  —Emergency Lighting Systems
  —Communications
  —Cellular Phones/Mobile Radio
  —Portable Instruments

GENERAL DESCRIPTION

The TC677 and TC678 are designed for use with both NiCad and Ni-Hydride batteries. These two devices meet the needs of the system designer whose battery charge applications require fast, reliable, and safe design.

The many automatic, programmable and selectable features of these devices provide capabilities found only in more expensive implementations. This, combined with the inherent device capability for use in both AC or DC power sources, provides a flexible cost-effective solution to battery recharge maintenance.

FUNCTIONAL BLOCK DIAGRAM



NOTE: PIN NUMBERS REFER TO 14-PIN DIP

* TC677 'TRICKLE', '1' — TRICKLE-CHARGE
TC678 'RESET', '0' — FAST-CHARGE

TelCom
Semiconductor, Inc.

TC1044S

DC-TO-DC VOLTAGE CONVERTER

FEATURES

- **Converts +5V Logic Supply to ±5V System**
- **Wide Input Voltage Range .... 1.5V to 12V**
- **Efficient Voltage Conversion 99.9%**
- **Excellent Power Efficiency 98%**
- **Low Power Supply .... 180 μA Max**
- **Low Cost and Easy to Use**
  — Only Two External Capacitors Required
- **RS-232 Negative Power Supply**
- **Available in Small Outline (SO) Package**
- **Improved ESD Protection .... Up to 10kV**
- **No External Diode Required for High Voltage Operation**

GENERAL DESCRIPTION

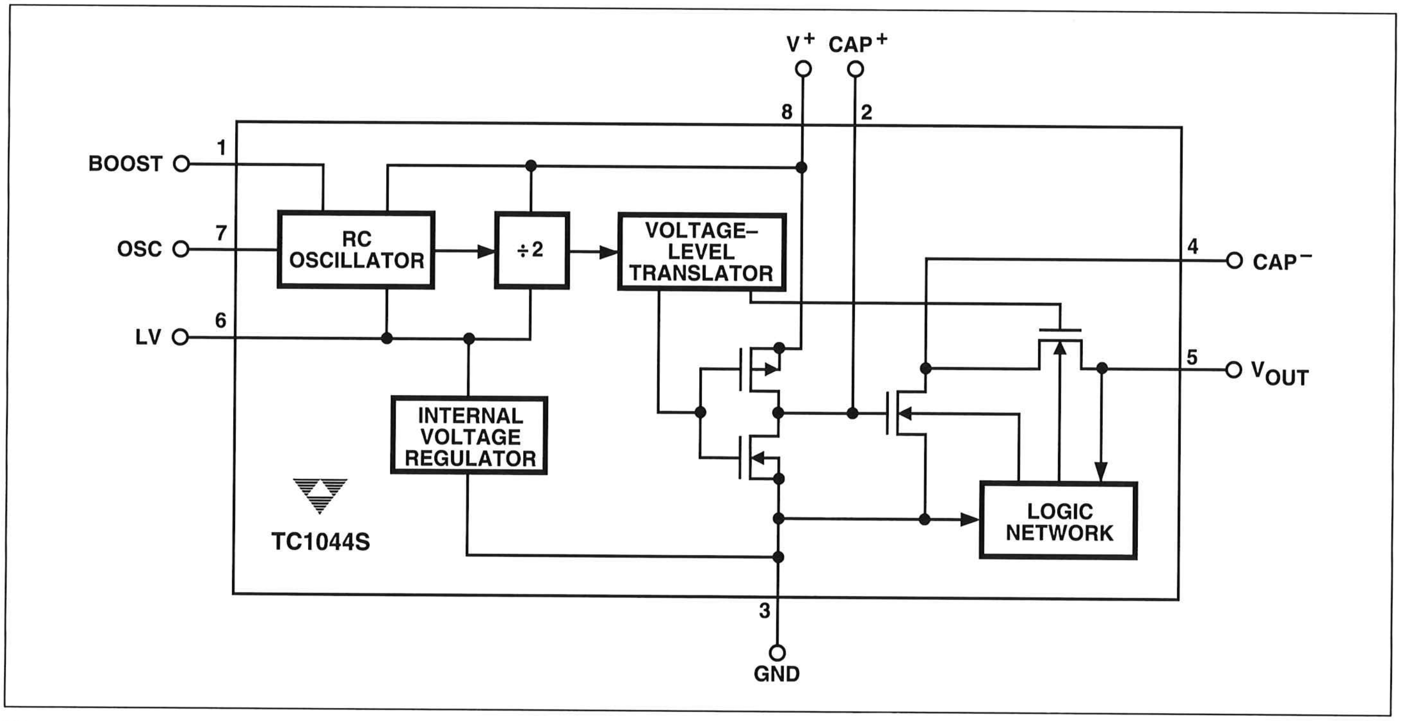
The TC1044S DC-to-DC voltage converter is the Super Voltage Converter version of TC7660. Added features include extended operating supply voltage range up to 12V, and frequency boost pin for higher operating frequency to lower output impedance with smaller capacitors.

The TC1044S can generate a negative voltage from a positive source. With two external capacitors, the TC1044S will convert a 1.5V to 12V input signal to a -1.5V to -12V level. The TC1044S easily generates -5V in +5V digital systems.

Many A/D converters, D/A converters, operational amplifiers, and multiplexers require negative supply voltages. The TC1044S allows +5V digital logic systems to incorporate these analog components without adding an additional main power source. The TC1044S can lower total system cost, ease engineering development, and save space, power and weight.

The TC1044S charges a capacitor to the applied supply voltage. Internal analog switches connect the capacitor across the output. Charge is then transferred to an output storage capacitor completing the voltage conversion. Operation requires only two external capacitors for full supply voltage range.

FUNCTIONAL BLOCK DIAGRAM



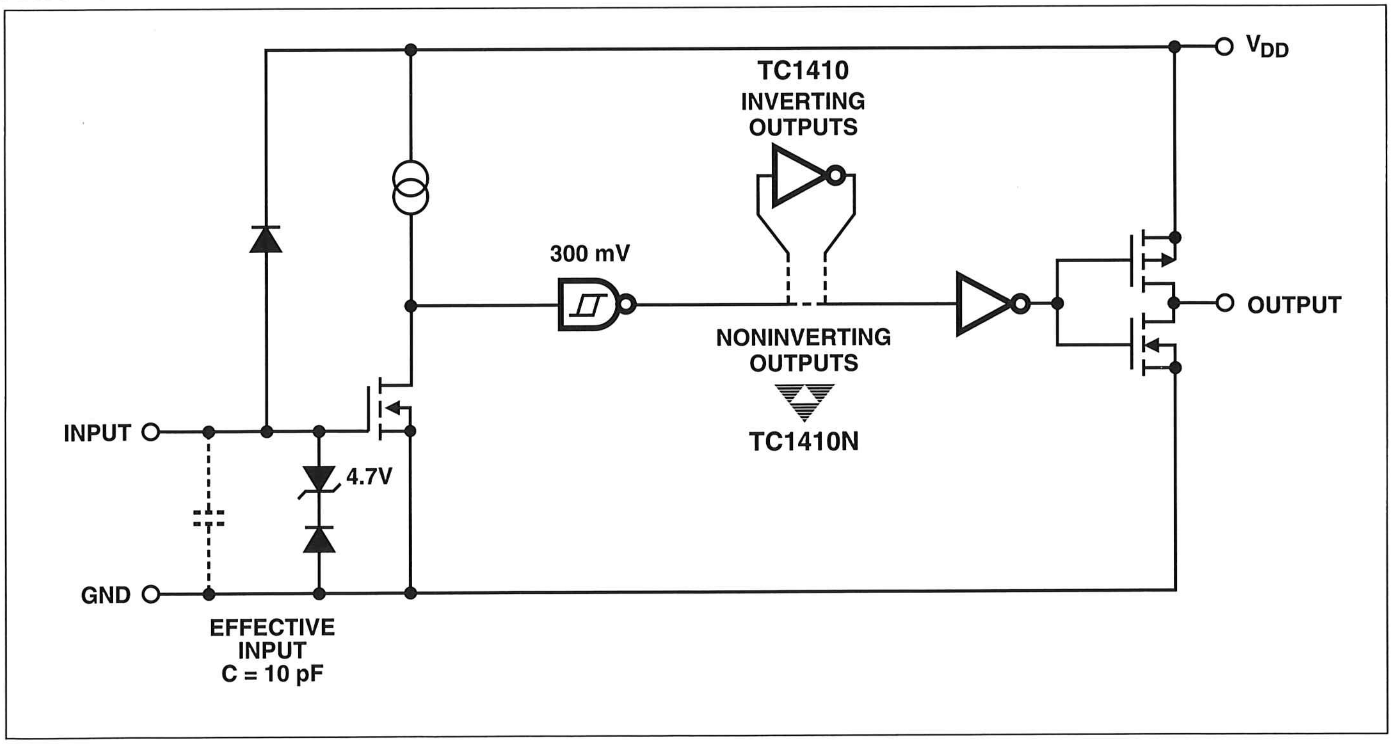
TC1410
TC1410N

0.5A HIGH-SPEED MOSFET DRIVERS

FEATURES

- Tough CMOS™ Construction
- Latch-Up Protected: Will Withstand 500mA Reverse Current
- Input Will Withstand Negative Inputs Up to 5V
- ESD Protected .... 4 kV
- High Peak Output Current 0.5A
- Wide Operating Range .... 4.5V to 16V
- High Capacitive Load Drive Capability .... 500 pF in 25 ns
- Short Delay Time .... 35 ns Typ
- Consistent Delay Times With Changes in Supply Voltage
- Matched Delay Times
- Logic High Input for Any Voltage From 2.0V to V_{DD}
- Logic Input Threshold Independent of Supply Voltage
- Low Supply Current
  - — With Logic "1" Input .... 500 µA
  - — With Logic "0" Input .... 150 µA
- Low Output Impedance .... 16 Ω
- Output Voltage Swing to Within 25 mV of Ground or V_{DD}
- Pinout Same as TC1411/12/13
- Available in Inverting and Noninverting Output

FUNCTIONAL BLOCK DIAGRAM



TelCom Semiconductor, Inc.

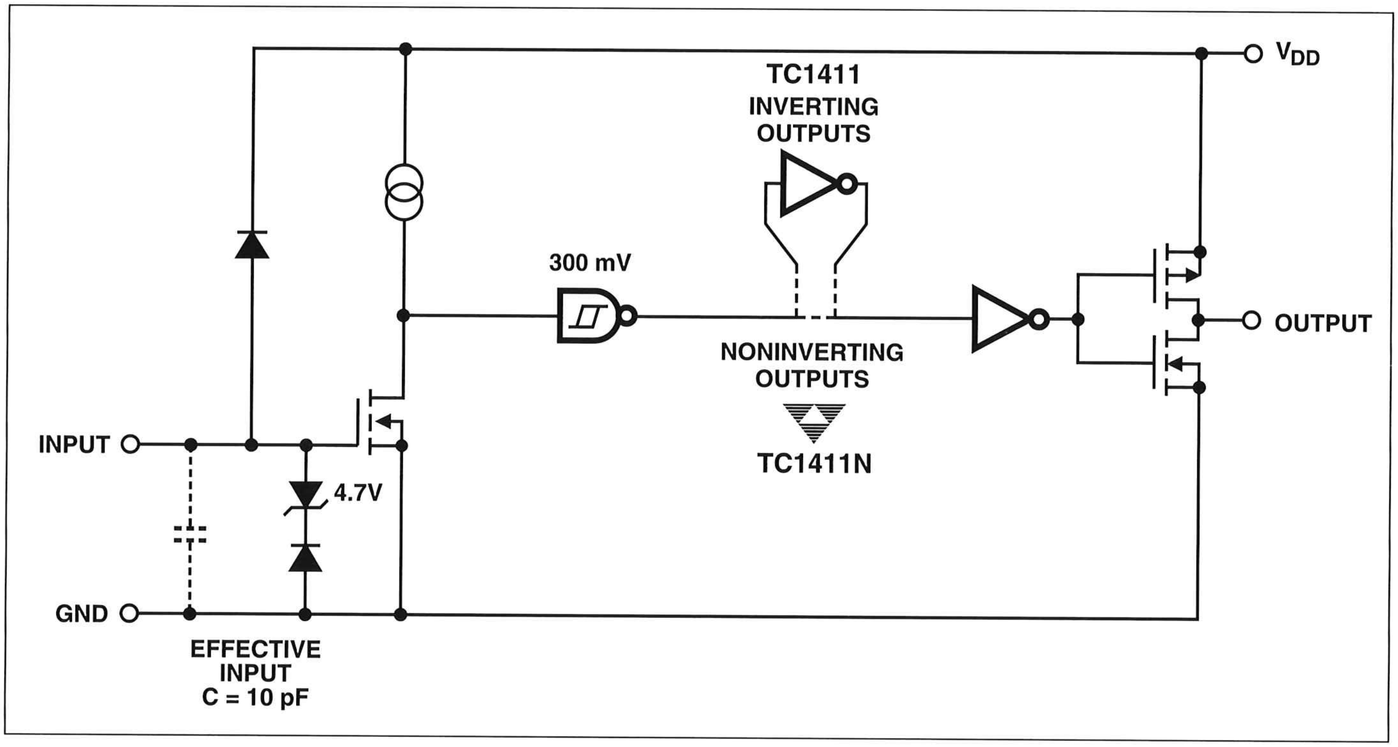
TC1411
TC1411N

1A HIGH-SPEED MOSFET DRIVERS

FEATURES

- Tough CMOS™ Construction
- Latch-Up Protected: Will Withstand 500mA Reverse Current
- Input Will Withstand Negative Inputs Up to 5V
- ESD Protected .... 4 kV
- High Peak Output Current 1A
- Wide Operating Range .... 4.5V to 16V
- High Capacitive Load Drive Capability .... 1000 pF in 25 ns
- Short Delay Time .... 30 ns Typ
- Consistent Delay Times With Changes in Supply Voltage
- Matched Delay Times
- Logic High Input for Any Voltage From 2.0V to V_{DD}
- Logic Input Threshold Independent of Supply Voltage
- Low Supply Current
  - — With Logic "1" Input .... 500 µA
  - — With Logic "0" Input .... 150 µA
- Low Output Impedance .... 8 Ω
- Output Voltage Swing to Within 25 mV of Ground or V_{DD}
- Pinout Same as TC1410/12/13
- Available in Inverting and Noninverting Output

FUNCTIONAL BLOCK DIAGRAM



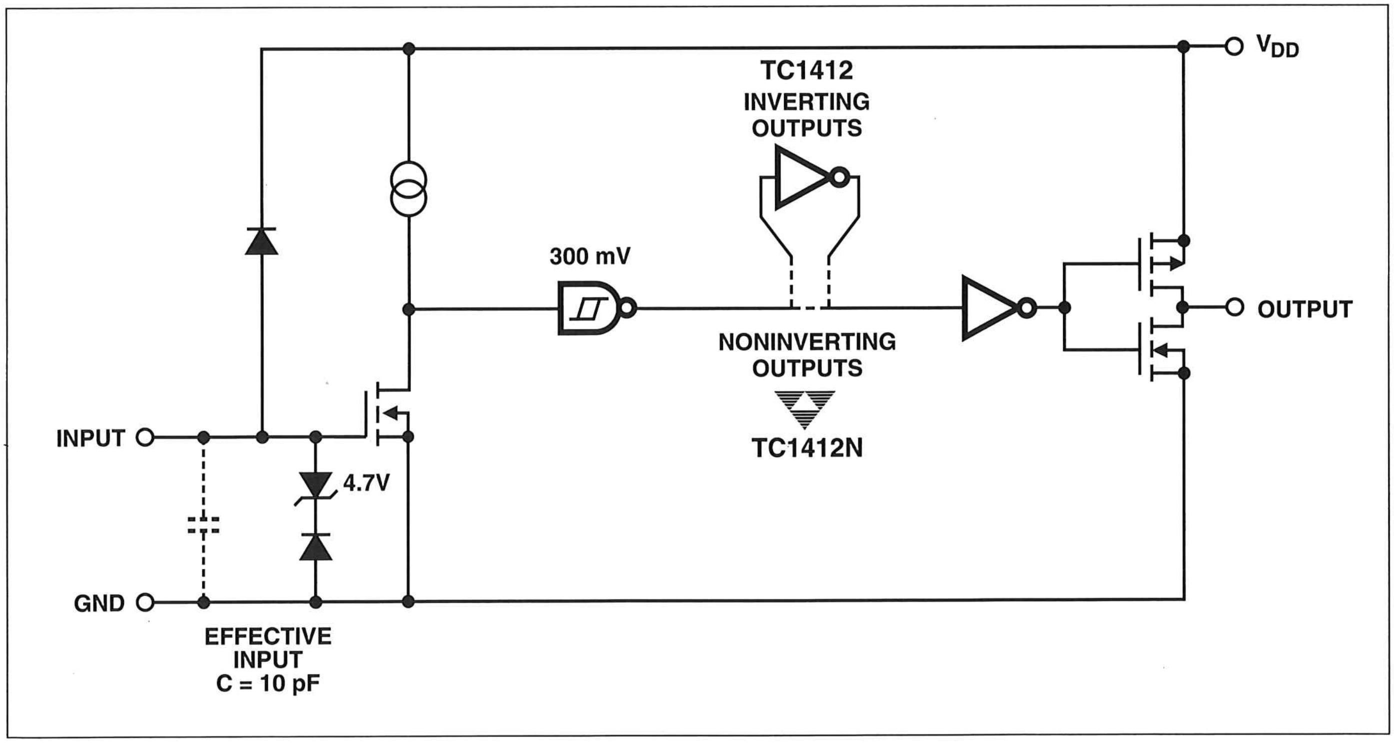
TC1412
TC1412N

2A HIGH-SPEED MOSFET DRIVERS

FEATURES

- Tough CMOS™ Construction
- Latch-Up Protected: Will Withstand 500mA Reverse Current
- Input Will Withstand Negative Inputs Up to 5V
- ESD Protected .... 4 kV
- High Peak Output Current 2A
- Wide Operating Range .... 4.5V to 16V
- High Capacitive Load Drive Capability .... 1000 pF in 18 ns
- Short Delay Time..................................... 35 ns Typ
- Consistent Delay Times With Changes in Supply Voltage
- Matched Delay Times
- Logic High Input for Any Voltage From 2.0V to V_{DD}
- Logic Input Threshold Independent of Supply Voltage
- Low Supply Current
  - — With Logic "1" Input................................ 500 µA
  - — With Logic "0" Input................................ 150 µA
- Low Output Impedance .... 4 Ω
- Output Voltage Swing to Within 25 mV of Ground or V_{DD}
- Pinout Same as TC1410/11/13
- Available in Inverting and Noninverting Output

FUNCTIONAL BLOCK DIAGRAM



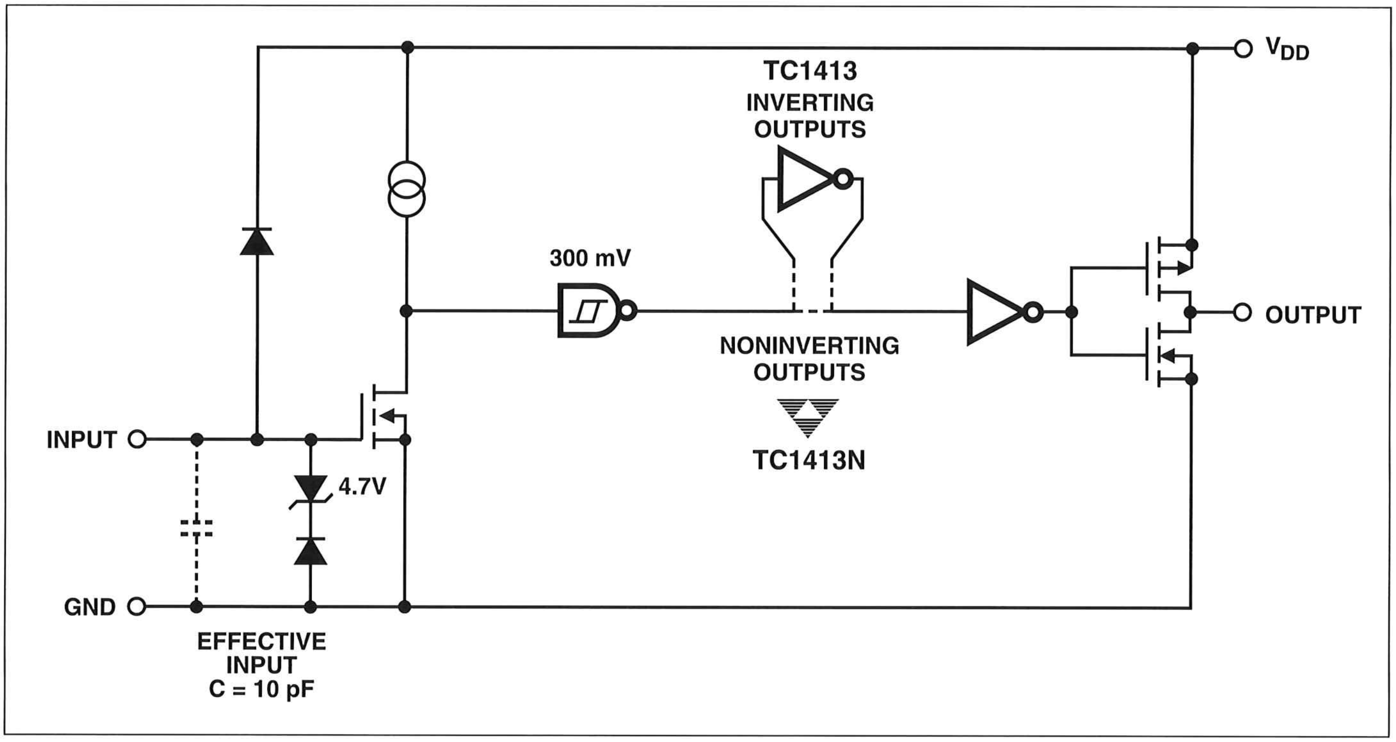
TC1413
TC1413N

3A HIGH-SPEED MOSFET DRIVERS

FEATURES

- Tough CMOS™ Construction
- Latch-Up Protected: Will Withstand 500mA Reverse Current
- Input Will Withstand Negative Inputs Up to 5V
- ESD Protected .... 4 kV
- High Peak Output Current 3A
- Wide Operating Range .... 4.5V to 16V
- High Capacitive Load Drive Capability .... 1800 pF in 20 ns
- Short Delay Time .... 35 ns Typ
- Consistent Delay Times With Changes in Supply Voltage
- Matched Delay Times
- Logic High Input for Any Voltage From 2.0V to V_{DD}
- Logic Input Threshold Independent of Supply Voltage
- Low Supply Current
  - — With Logic “1” Input .... 500 µA
  - — With Logic “0” Input .... 150 µA
- Low Output Impedance .... 2.7 Ω
- Output Voltage Swing to Within 25 mV of Ground or V_{DD}
- Pinout Same as TC1410/11/12
- Available in Inverting and Noninverting Output

FUNCTIONAL BLOCK DIAGRAM



TelCom
Semiconductor, Inc.

TC4426A
TC4427A
TC4428A

1.5A DUAL HIGH-SPEED FET DRIVERS

FEATURES

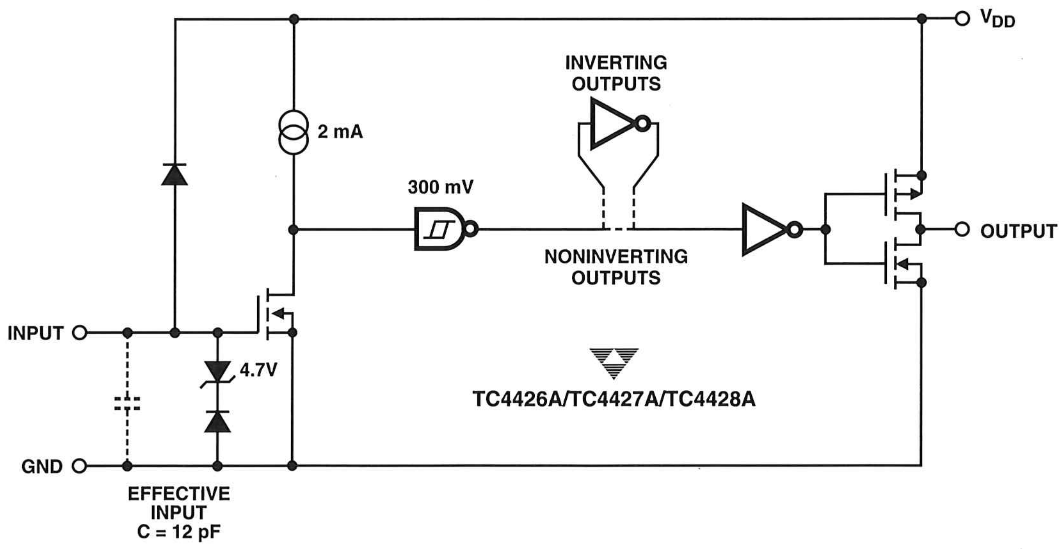
- **Tough CMOS™ Construction**
- **Latch-Up Protected: Will Withstand 0.5A Reverse Current**
- **Input Will Withstand Negative Inputs Up to 5V**
- **ESD Protected .... 4 kV**
- **High Peak Output Current 1.5A**
- **Wide Operating Range .... 4.5V to 18V**
- **High Capacitive Load Drive Capability .... 1000 pF in 25 ns Typ**
- **Short Delay Time .... 30 ns Typ**
- **Matched Rise and Fall Times**
- **Matched Delay Times**
- **Logic High Input for Any Voltage From 2.4V to V_{DD}**
- **Logic Input Threshold Independent of Supply Voltage**
- **Low Supply Current**
  - **— With Logic "1" Input .... 1 mA Typ**
  - **— With Logic "0" Input .... 100 μA Typ**
- **Low Output Impedance .... 7Ω Typ**
- **Output Voltage Swing to Within 25 mV of Ground or V_{DD}**
- **Pinout Same as TC426/TC427/TC428**
- **Available in Inverting, Noninverting, and Differential Configurations**

GENERAL DESCRIPTION

The TC4426A/4427A/4428A are CMOS buffer/drivers built using TelCom Semiconductors' Tough CMOS™ process. They are improved versions of the earlier TC426/427/428 family of buffer/drivers (with which they are pin compatible) and are capable of giving reliable service in far more demanding electrical environments. They will not latch up under any conditions with their power and voltage ratings. They are not subject to damage when up to 5V of noise spiking (of either polarity) occurs on the ground pin. They can accept, without damage or logic upset, up to 500 mA of reverse current (of either polarity) being forced back into their outputs. All terminals are fully protected against up to 4kV of electrostatic discharge.

As a result, the TC4426A/4427A/4428A drivers are much easier to use, more flexible in operation, and much more forgiving than any other drivers (CMOS or bipolar) currently available. Because they are fabricated in CMOS, they dissipate a minimum of power and provide rail-to-rail voltage swings to ensure the logic state of any load they are driving.

FUNCTIONAL BLOCK DIAGRAM



NOTES: 1. TC4428A has one inverting and one noninverting driver.
2. Ground any unused driver input.

TelCom
Semiconductor, Inc.

TC4431
TC4432

1.5A HIGH-SPEED 30V FET DRIVERS

FEATURES

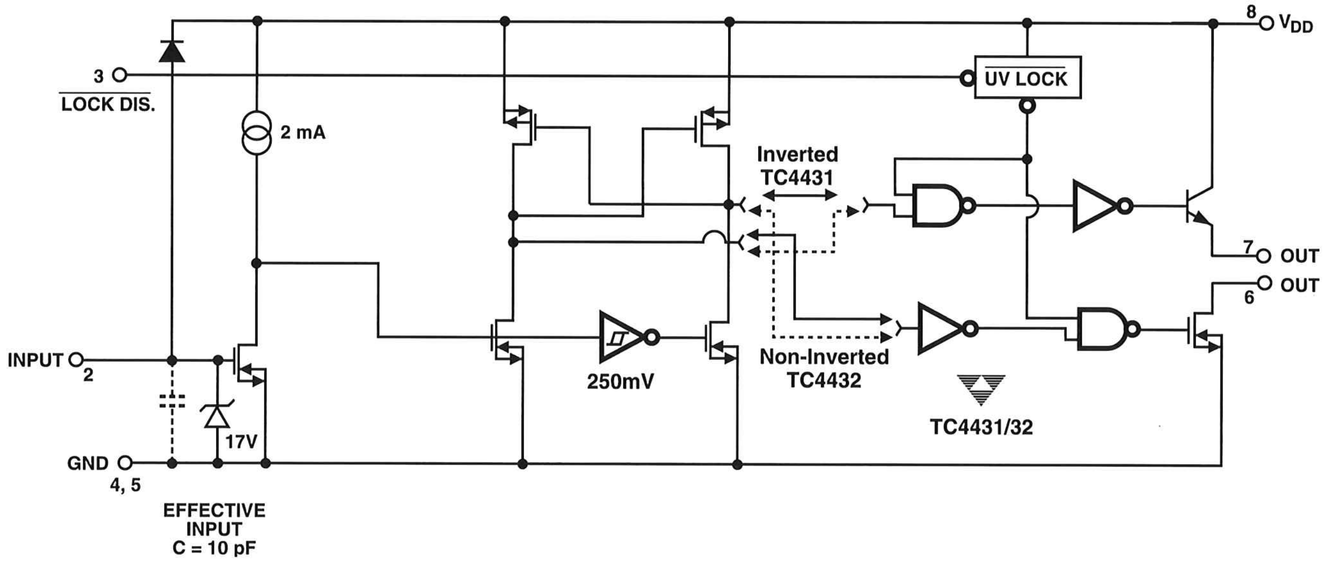
- **Tough CMOS™ Construction**
- **Latch-Up Protected: Will Withstand >300mA Reverse Current**
- **ESD Protected .... 4 kV**
- **High Peak Output Current 1.5A**
- **Wide Operating Range .... 5V to 30V**
- **High Capacitive Load Drive Capability .... 1000 pF in 25 ns**
- **Short Delay Time.................................... <78ns Typ**
- **Logic High Input for Any Voltage From 2.4V to 17V**
- **Logic Input Threshold Independent of Supply Voltage**
- **Low Supply Current**
  - **— With Logic "1" Input 2.5mA**
  - **— With Logic "0" Input 300μA**
- **Low Output Impedance 7Ω**
- **Output Voltage Swing to Within 25 mV of Ground or 300mV of V_{DD}**
- **Available in Inverting and Noninverting Configurations**

GENERAL DESCRIPTION

The TC4431/4432 are CMOS buffer/drivers built using TelCom Semiconductors' Tough CMOS™ process. They are improved version of the earlier TC4426/4427/4428 family of buffer/drivers and are capable of giving reliable service in far more demanding electrical environments. They will not latch up under any conditions within their power and voltage ratings. They can accept, without damage or logic upset, up to 300 mA of reverse current (of either polarity) being forced back into their outputs. All terminals are fully protected against up to 4kV of electrostatic discharge.

As a result, the TC4431/4432 drivers are much easier to use, more flexible in operation, and much more forgiving than any other drivers (CMOS or bipolar) currently available. Because they are fabricated in CMOS, they dissipate a minimum of power.

FUNCTIONAL BLOCK DIAGRAM



TC4626
TC4627

POWER CMOS DRIVERS WITH VOLTAGE BOOSTER

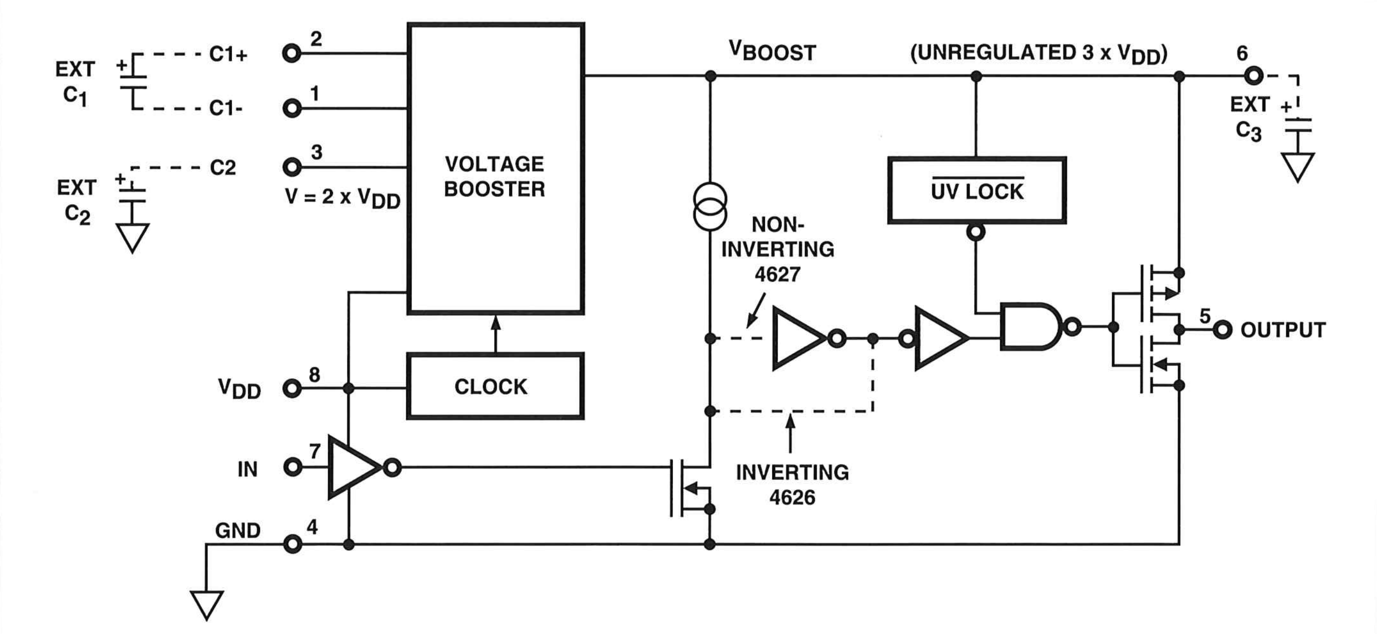
FEATURES

- **Power driver with on Board Voltage Booster**
- **Low IDD < 4 mA**
- **Small Package - 8 Pin PDIP**
- **Under voltage Circuitry**
- **Fast Rise-Fall Time < 40 ns @ 1000pF**
- **Below Rail Input Protection**

GENERAL DESCRIPTION

The TC4626/4627 are single CMOS high speed drivers with an on-board voltage boost circuit. Operation is possible with an input supply voltage from 4 to 6 volts. The internal voltage booster will produce a V_{BOOST} potential up to 12 volts. This V_{BOOST} is not regulated so its voltage is dependent on the input V_{DD} voltage and output drive loading requirements. An internal undervoltage lockout circuit keeps the output in a low state when V_{BOOST} drops below 7.8 volts. Output is enabled when V_{BOOST} is above 11.3 volts.

FUNCTIONAL BLOCK DIAGRAM



NOTE: Pin numbers correspond to 8-pin package

TC4803
TC4804

1.4A HIGH-SPEED OPTO-ISOLATED POWER MOSFET DRIVER

FEATURES

- **Input to Output Isolation TO 2.5kV RMS**
- **Operating Range .... 10V to 18V**
- **High Peak Output Current .... 1.4A Typ**
- **Short Delay Time .... <200 ns Typ**
- **Fast Switching on Outputs .... T_R, T_F < 60nS Typ .... with C_L = 1000pF**
- **Low Power BiCMOS Design**
- **Undervoltage Lockout with Hysteresis**

APPLICATIONS

- **Isolated Digital Line Driver**
- **Isolated Line Receiver**
- **"High-Side" Driver**
- **SMPS Control**
- **Motor Control**
- **Solid State Relays**
- **Off-Line Regulation/Control**

UL File No: E151672 on TC4803/4

GENERAL DESCRIPTION

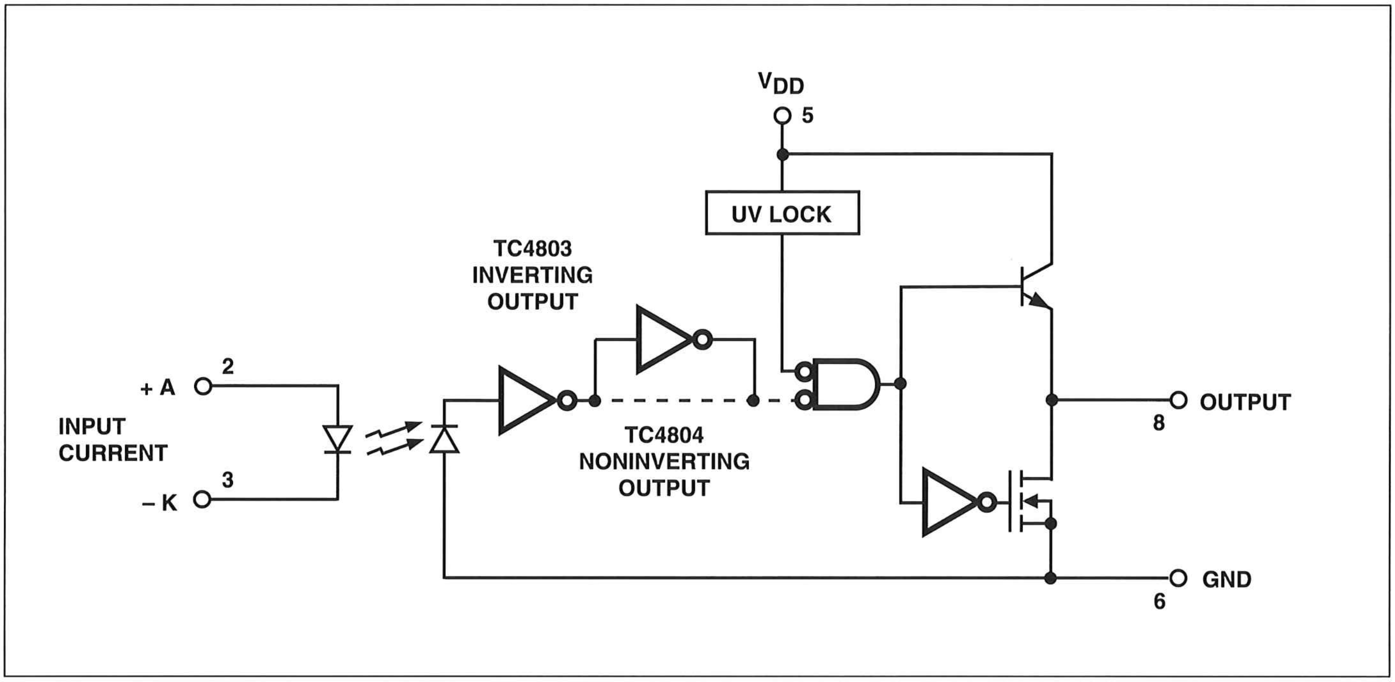
The TC4803 AND TC4804 are BiCMOS optocoupled driver ICs ideal for switching loads when electrical isolation is desired. Input drive current is converted to low impedance voltage drive with the ability to drive 1.4A peak current into a capacitive load of 1,000 pF with fast output rise and fall times. UV lockout circuitry forces the output to a "off" state when the input voltage drops below 7.8V. Hysteresis of 0.4V prevents output toggling around the dropout voltage. The output "off" state is low on both the TC4803 and the TC4804.

For switching many loads in low-power regimes, these drivers, because they reduce shoot-through currents in the output stage, require significantly less power at higher frequencies, and can be helpful in meeting low-power budgets.

These devices are built using TelCom Semiconductors' Tough CMOS™ process and are capable of giving reliable service in the most demanding electrical environments.

They will not latch under normal conditions within their power and voltage ratings. All terminals are fully protected against up to 2.5 kV of electrostatic discharge.

FUNCTIONAL BLOCK DIAGRAM



DC-TO-DC VOLTAGE CONVERTER

FEATURES

- **Converts +5V Logic Supply to ±5V System**
- **Wide Input Voltage Range .... 1.5V to 12V**
- **Efficient Voltage Conversion 99.9%**
- **Excellent Power Efficiency 98%**
- **Low Power Supply .... 180 µA Max**
- **Low Cost and Easy to Use**
  — Only Two External Capacitors Required
- **RS-232 Negative Power Supply**
- **Available in Small Outline (SO) Package**
- **Improved ESD Protection .... Up to 10kV**
- **No External Diode Required for High Voltage Operation**

GENERAL DESCRIPTION

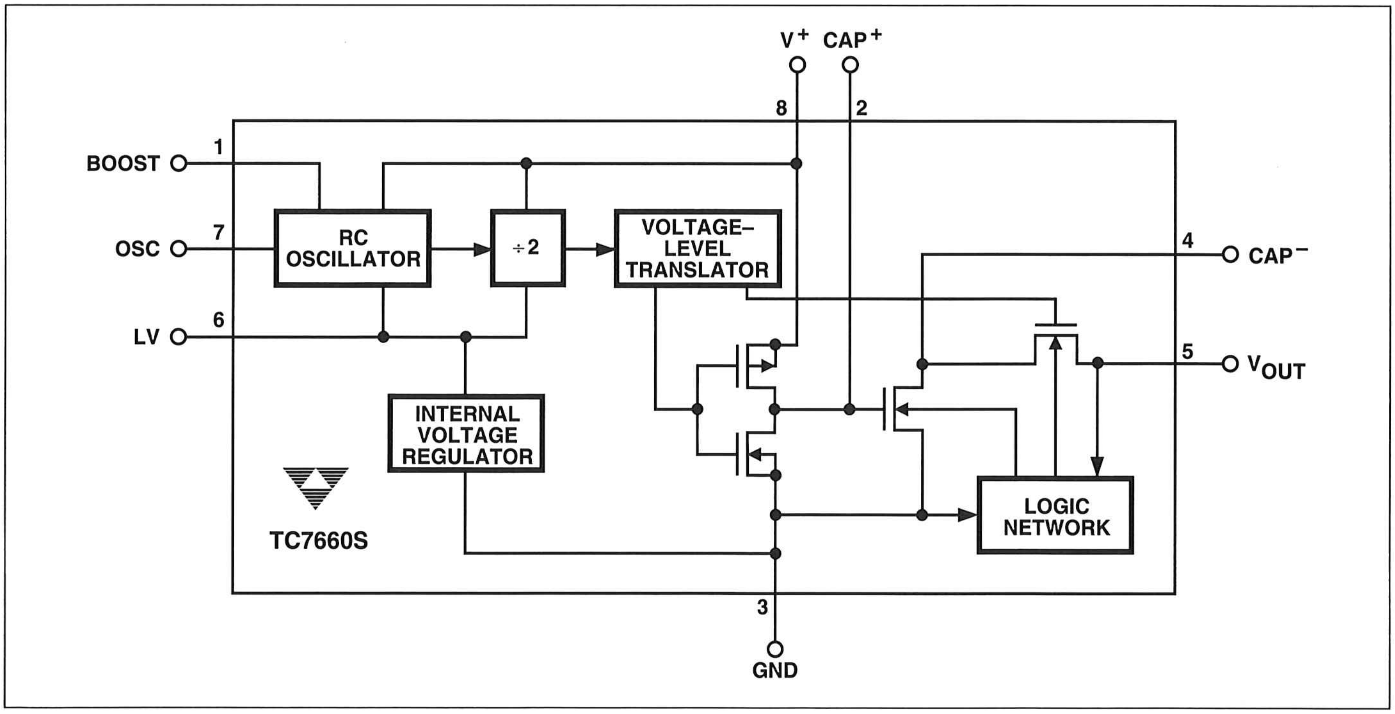
The TC7660S DC-to-DC voltage converter is the Super Voltage Converter version of TC7660. Added features include extended operating supply voltage range up to 12V, and frequency boost pin for higher operating frequency to lower output impedance with smaller capacitors.

The TC7660S can generate a negative voltage from a positive source. With two external capacitors, the TC7660S will convert a 1.5V to 12V input signal to a -1.5V to -12V level. The TC7660S easily generates -5V in +5V digital systems.

Many A/D converters, D/A converters, operational amplifiers, and multiplexers require negative supply voltages. The TC7660S allows +5V digital logic systems to incorporate these analog components without adding an additional main power source. The TC7660S can lower total system cost, ease engineering development, and save space, power and weight.

The TC7660S charges a capacitor to the applied supply voltage. Internal analog switches connect the capacitor across the output. Charge is then transferred to an output storage capacitor completing the voltage conversion. Operation requires only two external capacitors for full supply voltage range.

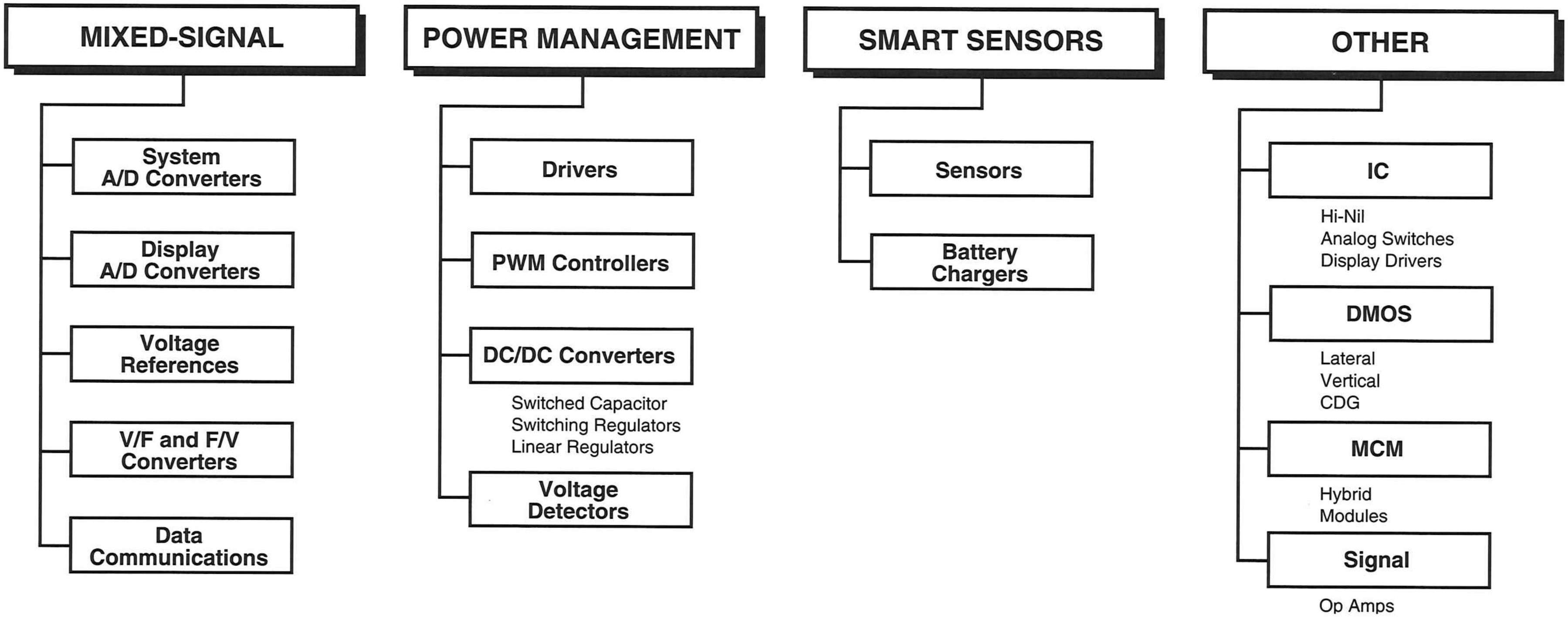
FUNCTIONAL BLOCK DIAGRAM



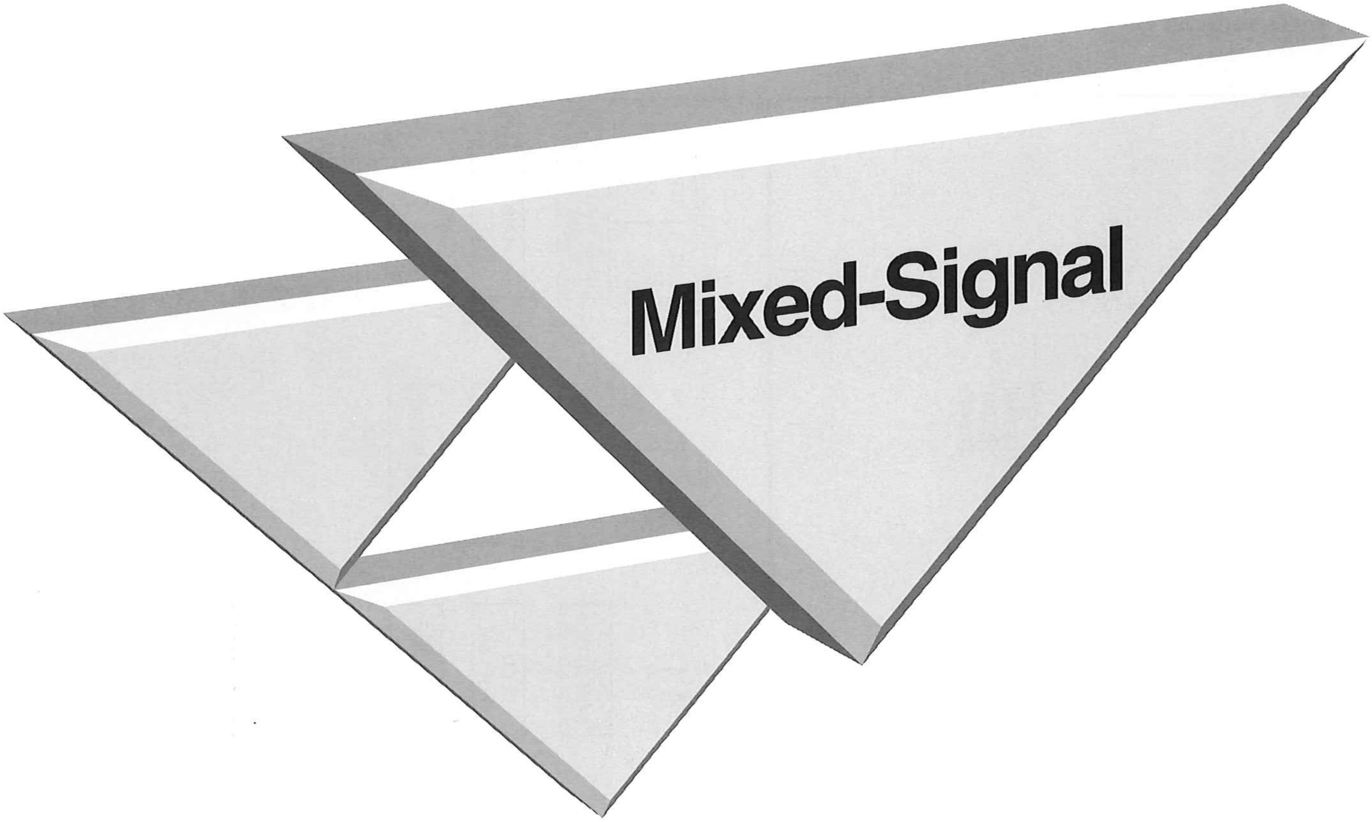
Selection Guide

Section 2

TelCom Semiconductor, Inc.
TOTAL PRODUCT PORTFOLIO

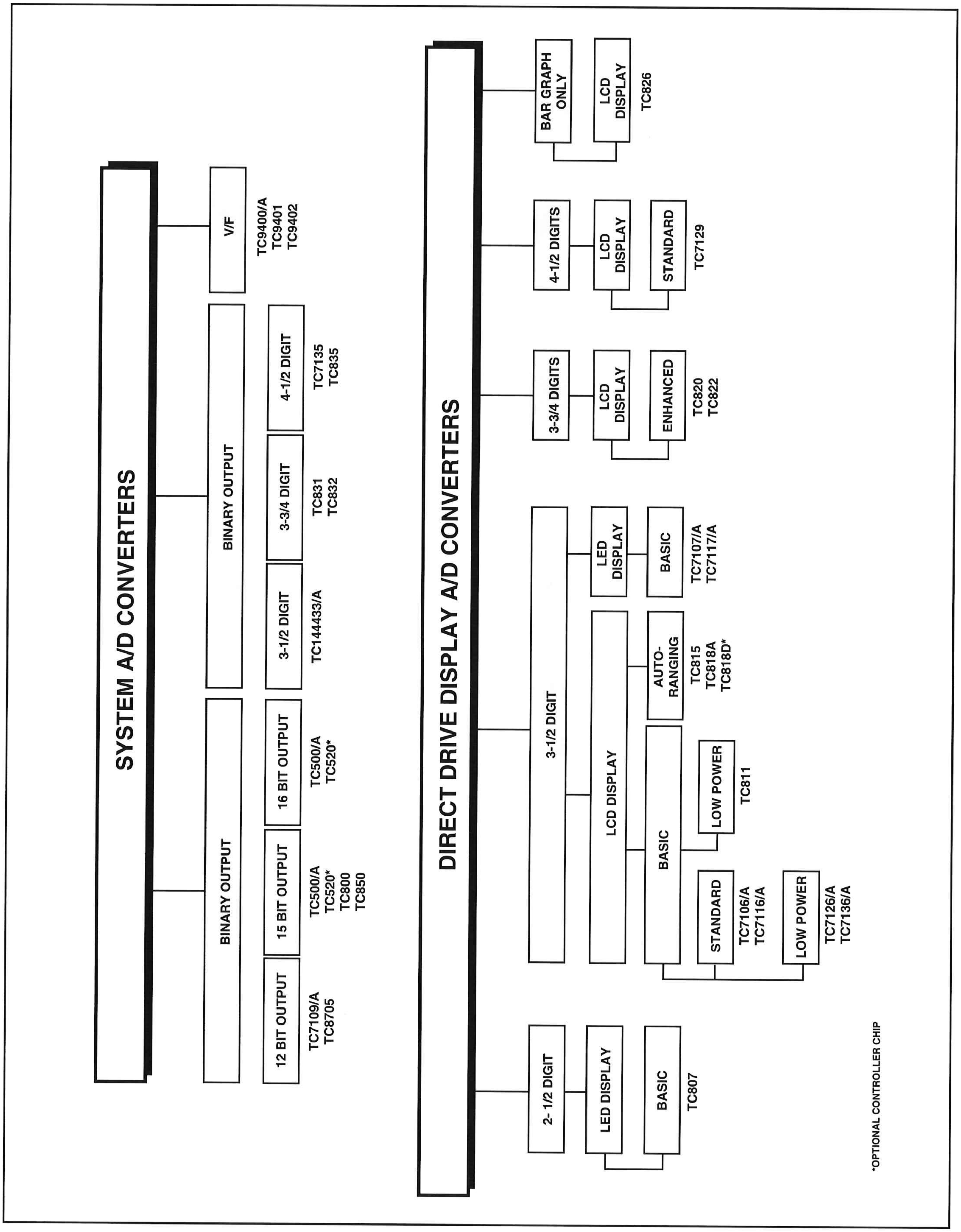


- **MIXED-SIGNAL**
  - System A/D Converters
  - Display A/D Converters
  - Voltage References
  - V/F and F/V Converters
  - Data Communications
- **POWER MANAGEMENT**
  - Drivers
  - PWM Controllers
  - DC/DC Converters
    - Switched Capacitor
    - Switching Regulators
    - Linear Regulators
  - Voltage Detectors
- **SMART SENSORS**
  - Sensors
  - Battery Chargers
- **OTHER**
  - IC
    - Hi-Nil
    - Analog Switches
    - Display Drivers
  - DMOS
    - Lateral
    - Vertical
    - CDG
  - MCM
    - Hybrid
    - Modules
  - Signal
    - Op Amps



Mixed-Signal

- ▼ System A/D Converters
- ▼ Display A/D Converters
- ▼ Voltage References
- ▼ V/F and F/V Converters
- ▼ Data Communications


SYSTEM A/D CONVERTERS
BINARY OUTPUT
12 BIT OUTPUT
TC7109/A
TC8705
15 BIT OUTPUT
TC500/A
TC520*
TC800
TC850
16 BIT OUTPUT
TC500/A
TC520*
BINARY OUTPUT
3-1/2 DIGIT
TC144433/A
3-3/4 DIGIT
TC831
TC832
4-1/2 DIGIT
TC7135
TC835
V/F
TC9400/A
TC9401
TC9402
DIRECT DRIVE DISPLAY A/D CONVERTERS
2- 1/2 DIGIT
LED DISPLAY
BASIC
TC807
3-1/2 DIGIT
LCD DISPLAY
BASIC
STANDARD
TC7106/A
TC7116/A
LOW POWER
TC7126/A
TC7136/A
LOW POWER
TC811
AUTO-RANGING
TC815
TC818A
TC818D*
LED DISPLAY
BASIC
TC7107/A
TC7117/A
3-3/4 DIGITS
LCD DISPLAY
ENHANCED
TC820
TC822
4-1/2 DIGITS
LCD DISPLAY
STANDARD
TC7129
BAR GRAPH ONLY
LCD DISPLAY
TC826
*OPTIONAL CONTROLLER CHIP

ANALOG-TO-DIGITAL CONVERTERS
SYSTEM A/D CONVERTERS

TelCom Semiconductor offers a wide variety of low power CMOS, microprocessor compatible A/D converter products. These cost effective integrating converters are well-suited for all applications and feature extraordinary high resolution and high noise immunity.

Binary Output

Part #	Resolution (Bits)	Input Range	Linearity Error (% FS)	FS Magnitude Symmetry Error (% FS)	Power Dissipation (mW)	Three-State Outputs	Package	Feature
TC500	14	±3.5V	±0.005	±0.01	10	—	3	Processor Controlled
TC500A	16	±3.5V	±0.003	±0.006	10	—	2	Processor Controlled
# TC520	16	±3.5V	±0.003	±0.006	4	X	1, 2	Serial Controller for TC500/A
TC800	15	±3.5V	±0.009	±0.006	20	X	4, 5	
TC850	15	±3.5V	±0.003	±0.003	20	X	4, 5	Fast Conversion
TC7109	12	±3.5V	±0.025	±0.025	20	X	4, 5	Low Cost
TC7109A	12	±3.5V	±0.025	±0.025	20	X	4, 5	Fast Recovery

All devices are auto zeroing µP compatible

Input Multiplexer[1]

Part #	Resolution (Bits)	Input Range (V)	Linearity Error (% FS)	FS Magnitude Symmetry Error (% FS)	Power Dissipation (mW)	µP Interface	Three-State Outputs	Auto-Zero	Package
TC804	12	±3.5	±0.025	±0.025	20	X	X	X	68-Pin FP

NOTES: 1. 4-channel differential or 8-channel single-ended

BCD Output

Part #	Resolution (Bits)	Input Range (V)	Linearity Error (% FS)	FS Magnitude Symmetry Error (Counts)	Power Dissipation (mW)	µP Interface	Latched Outputs	Package	Feature
TC831	3-3/4	±3.5	±0.025	±1	10	X	—	4, 5, 6	5V Frequency Count
TC832	3-3/4	±2.00	±0.025	±1	10	X	—	4, 5, 6	9V Frequency Count
TC835	4-1/2	±1.99	±0.025	±1	30	X	—	7, 9	PC Applications
TC7135	4-1/2	±1.99	±0.025	±1	30	X	—	7, 9, 10	
TC8750	3-1/2	±10µA	±0.025	—	35	—	X	8	
TC144433	3-1/2	±1.99	±0.05	—	25	—	—	7, 8, 11	
TC144433A	3-1/2	±1.99	±0.05	±1	25	—	—	8, 11	

* All devices are auto zeroing.

NOTES: # = New Products
1. 14-Pin DIP
2. 16-Pin SO
3. 16-Pin CerDIP or Plastic
4. 40-Pin DIP
5. 44-Pin PLCC
6. QFP
7. 28-Pin DIP
8. 24-Pin DIP
9. PLCC
10. 60-Pin FP
11. 28-Pin PLCC

DISPLAY A/D CONVERTERS

TelCom Semiconductor offers the industry's widest selection of display A/Ds, with resolution for 2-1/2 to 4-1/2 digits. These A/D Converters will directly drive an LED or LCD display. The integrating conversion method ensures high accuracy and stable readings, while low power CMOS circuitry permits 2000 hours of operation from a 9V battery. Other features available on some models include autoranging, frequency counter and logic probe, bar graph output, and single 3V battery operation.

Part #	Resolution (Digits)	Power (mW)	Supply Voltage (V)	Internal Reference	Differential Reference	Guaranteed Ref T.C.	"HOLD" Feature	LCD Drive	LED Drive
TC807	2-1/2	10	±5	X	X	X	—	—	X
TC811(1)	3-1/2	0.6	9	X	X	X	X	X	—
TC815(2)	3-1/2	10	9	X	—	—	X	X	—
TC818(3)	3-1/2	10	9	X	—	—	X	X	—
TC820(1, 4)	3-3/4	10	9	X	X	X	X	X	—
TC822(1)	3-3/4	1	3	X	X	—	X	X	—
TC826	2.5% Bar	20	9	X	—	—	X	X	—
TC7106	3-1/2	10	9	X	X	—	—	X	—
TC7106A	3-1/2	10	9	X	X	X	—	X	—
TC7107	3-1/2	10	±5	X	X	—	—	—	X
TC7107A	3-1/2	10	±5	X	X	X	—	—	X
TC7116	3-1/2	10	9	X	—	—	X	X	—
TC7116A	3-1/2	10	9	X	—	X	X	X	—
TC7117	3-1/2	10	±5	X	—	—	X	—	X
TC7117A	3-1/2	10	±5	X	—	X	X	—	X
TC7126	3-1/2	0.5	9	X	X	—	—	X	—
TC7126A	3-1/2	0.5	9	X	X	X	—	X	—
TC7129	4-1/2	4.5	9	X	X	—	X	X	—
TC7136(1)	3-1/2	0.5	9	X	X	—	—	X	—
TC7136A(1)	3-1/2	0.5	9	X	X	X	—	X	—

NOTES:
1. Fast overrange recovery.
2. Autoranging.
3. Autoranging with bar-graph.
4. Includes frequency counter and logic probe.

VOLTAGE REFERENCES

Band gap references are used in a wide variety of data acquisition and other applications. These low power devices will operate with a supply current of only 15µA, while not exceeding a temperature drift of 50 ppm/°C.

Part #	Reference Output V_{REF} (V)	Output Accuracy (% V_{REF})	V_{REF} Temperature Coefficient (ppm/°C)	Output Current (mA)	Package
TC04A	1.25	±2	±50	+20	TO-52, TO-92, 8-Pin SO
TC04B	1.25	±2	±100	+20	TO-52, TO-92, 8-Pin SO
TC05A	2.50	±2	±50	+20	TO-52, TO-92, 8-Pin SO
TC05B	2.50	±2	±100	+20	TO-52, TO-92, 8-Pin SO
TC385B-1.2	1.25	±2	±100	±20	TO-92, 8-Pin SO
TC385B-2.5	2.5	±2	±100	±20	TO-92, 8-Pin SO
TC9491A	1.22	±2	±50	+1	TO-18, TO-92
TC9491B	1.22	±2	±100	+1	TO-18, TO-92

FREQUENCY CONVERTERS

The wide dynamic range and stable operation make any of TelCom's frequency converters an excellent choice for low cost data conversion. Frequency domain converters are ideal for two-wire data transfer phase locked loops, medical isolation, flow measurement and general instrumentation applications.

Frequency to Voltage

Part #	Input Frequency Range(1)	Nonlinearity (% FS)	Zero Offset (% FS)	Full Scale (% FS)	Zero Offset (μV/°C)	Full Scale (ppm FS/°C)	Package
TC9400	100 kHz	±0.05	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic, SO
TC9401	100 kHz	±0.02	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic
TC9401A	100 kHz	±0.02	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic
TC9402	100 kHz	±0.25	±1	±10(t)	±100	±100	14-Pin DIP Plastic
TC9402A	100 kHz	±0.25	±1	±10(t)	±100	±100	14-Pin DIP Plastic

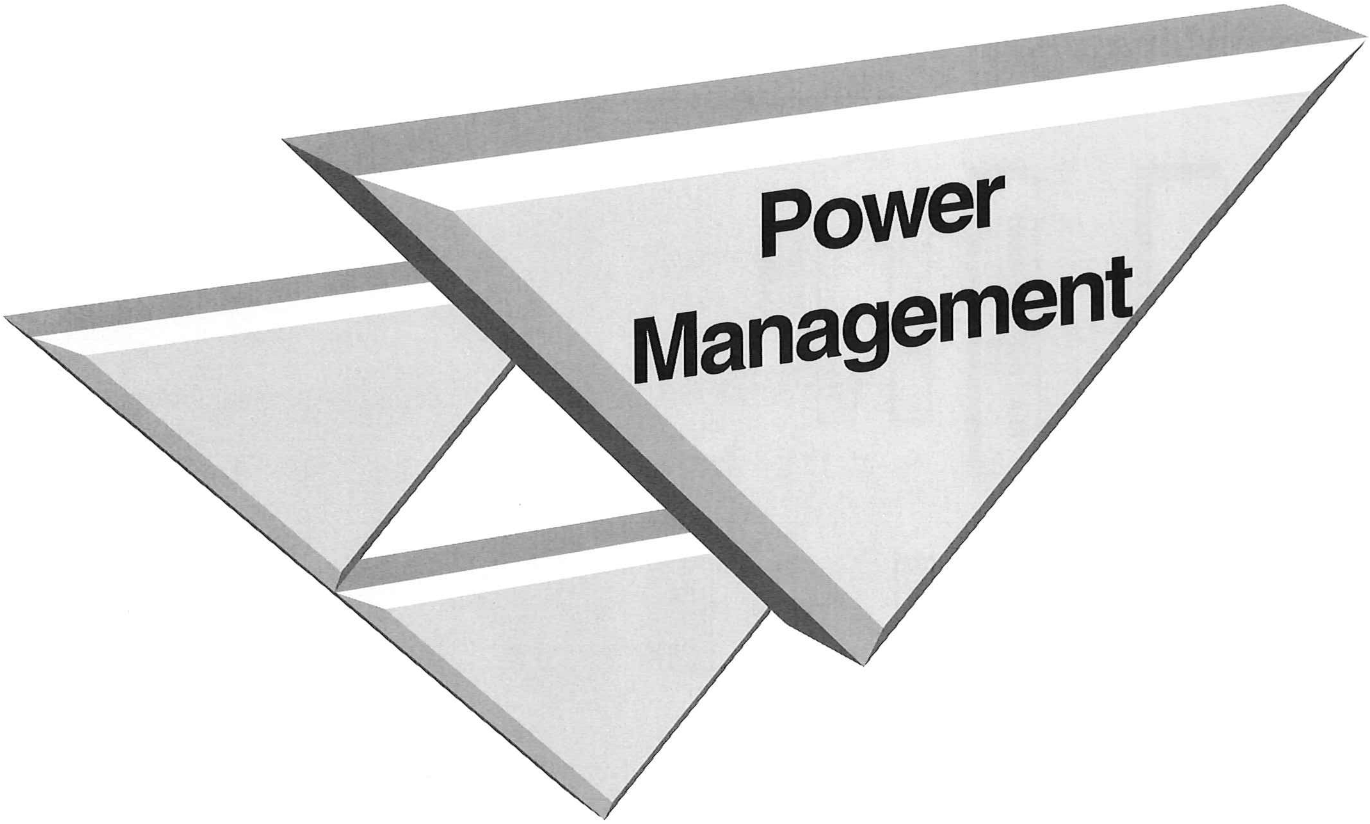
Voltage to Frequency

Part #	Output Frequency Range(1)	Nonlinearity (% FS)	Zero Offset (% FS)	Full Scale (% FS)	Zero Offset (μV/°C)	Full Scale (ppm FS/°C)	Package
TC9400	100 kHz	±0.25	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic, SO
TC9401	100 kHz	±0.08	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic
TC9401A	100 kHz	±0.08	±0.5	±10(t)	±50	±40	14-Pin DIP Plastic
TC9402	100 kHz	±0.5	±1	±10(t)	±100	±100	14-Pin DIP Plastic
TC9402A	100 kHz	±0.5	±1	±10(t)	±100	±100	14-Pin DIP Plastic

NOTES: Nonlinearity specification includes (±%FS) ± %Signal.
* 9400 Series operates as both V/F and F/V.
(t) Denotes typical.

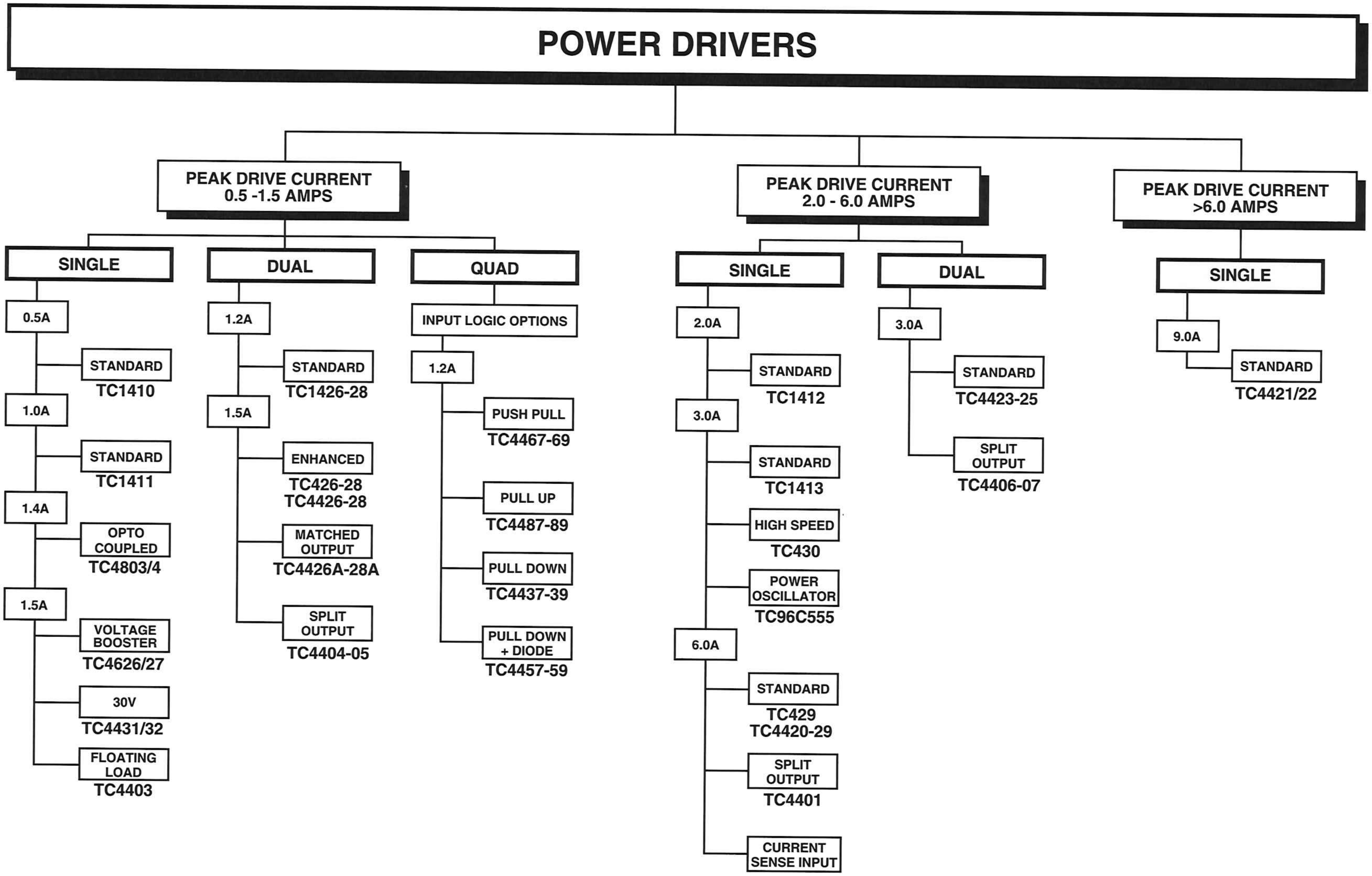
DATA COMMUNICATIONS

Part #	External Capacitors	Receive Channels	Transmit Channels	Power Supply Voltage (V)	Supply Current (mA)	Low Power Shutdown	Package
TC232	4	2	2	+5	5	No	16-Pin DIP, 16 SO



Power Management

- **Drivers**
- **PWM Controllers**
- **DC/DC Converters**
  - Switched Capacitor
  - Switching Regulators
  - Linear Regulators
- **Voltage Detectors**


POWER DRIVERS
PEAK DRIVE CURRENT 0.5 -1.5 AMPS
SINGLE
0.5A
STANDARD
TC1410
1.0A
STANDARD
TC1411
1.4A
OPTO COUPLED
TC4803/4
1.5A
VOLTAGE BOOSTER
TC4626/27
30V
TC4431/32
FLOATING LOAD
TC4403
DUAL
1.2A
STANDARD
TC1426-28
1.5A
ENHANCED
TC426-28
TC4426-28
MATCHED OUTPUT
TC4426A-28A
SPLIT OUTPUT
TC4404-05
QUAD
INPUT LOGIC OPTIONS
1.2A
PUSH PULL
TC4467-69
PULL UP
TC4487-89
PULL DOWN
TC4437-39
PULL DOWN + DIODE
TC4457-59
PEAK DRIVE CURRENT 2.0 - 6.0 AMPS
SINGLE
2.0A
STANDARD
TC1412
3.0A
STANDARD
TC1413
HIGH SPEED
TC430
POWER OSCILLATOR
TC96C555
6.0A
STANDARD
TC429
TC4420-29
SPLIT OUTPUT
TC4401
CURRENT SENSE INPUT
DUAL
3.0A
STANDARD
TC4423-25
SPLIT OUTPUT
TC4406-07
PEAK DRIVE CURRENT >6.0 AMPS
SINGLE
9.0A
STANDARD
TC4421/22

POWER DRIVER IC's

TelCom's flagship line of power drivers are made with proprietary Tough CMOS™ construction. These discrete replacement devices interface to a wide range of logic levels to directly drive motors, power MOSFETs, IGBTs, bipolar transistors, or inductive loads. All drivers have both latch-up and ESD protection of up to 4 kV on each pin. The product offering ranges from 30V power drivers to drivers with 0.5A to 9A peak output drive current capability as well as opto coupled drivers with 2,500 or 4,000 VRMS of isolation. Other drivers include a booster driver which will produce up to 12V drive from a 5V bias supply, programmable power oscillator driver, and a driver with matched TD1 and TD2 for processing short duration nanosecond pulses.

Typical 25°C Parameters

Part #	Single	Dual	Quad	Output Logic	Max. Oper. Voltage (V)	Max. Supply Current Is (mA)	Peak Current Ipk (A)	Switch Speed (nS)	Load Capacitance CL (pF)	Input to Output Delay tD1/tD2 (nS)	Package	Description
TC426		X		I	18	4.5	1.5	25	1,000	45/70	1, 2	High-Speed Power MOSFET Drivers
TC427		X		N								
TC428		X		B								
TC429	X			I	18	5	6	25	2,500	53/60	2	High Current Power MOSFET Driver
TC430	X			B	12	5	3	22	2,200	18/18	2	High Speed MOSFET Driver with Complimentary Outputs
#TC1410	X			B	16	1	0.5	25	470	30/30	1, 2	Single low-cost high-speed MOSFET Drivers with Latch Up Protection and Matched TD1 & TD2
#TC1411	X			B	16	1	1.0	25	1,000	30/30	1, 2	
#TC1412	X			B	16	1	2.0	18	1,400	35/35	1, 2	
#TC1413	X			B	16	1	3.0	20	1,800	35/35	1, 2	
TC1426		X		I	16	4.5	1.2	25	1,000	18/36	1, 2	High Speed Power MOSFET Driver with Latch Up Protection
TC1427		X		N								
TC1428		X		B								
TC4401	X			I	18	1.5	6	25	2,500	55/55	1, 2	Open-Drain High-Current Power MOSFET Driver
TC4403	X			B	18	2.5	3	15	1,800	33/38	2	Floating Load MOSFET Driver
TC4404		X		I	18	4.5	1.5	25	1,000	15/32	1, 2	Open-Drain Power MOSFET Drivers with Latch Up Protection
TC4405		X		N								
TC4406		X		I	18	2.5	3	25	1,800	33/38	2, 3	Open-Drain Power MOSFET Drivers with Latch Up Protection
TC4407		X		N								
TC4420	X			I	18	1.5	6	25	2,500	55/55	1, 2, 4	High Current Power MOSFET Drivers with Latch Up Protection
TC4429	X			N								
TC4421	X			I	18	1.5	9	60	10,000	30/33	2, 4	High Current Power MOSFET Drivers with Latch Up Protection
TC4422				N								
TC4423		X		I	18	3.5	3	25	1,800	33/38	2, 3	High Speed Power MOSFET Drivers with Latch Up Protection
TC4424		X		N								
TC4425		X		B								
TC4426		X		I	18	4.5	1.5	19	1,000	15/32	1, 2	High Speed Power MOSFET Drivers with Latch Up Protection
TC4427		X		N								
TC4428		X		B								
#TC4426A		X		I	18	1.0	1.5	19	1,000	26/26	1, 2	Same as non-A version with Matched Leading Edge Delay, TD1 & Falling Edge Delay, TD2
#TC4427A		X		N								
#TC4428A		X		B								
#TC4431	X			I	30	2.5	1.5	33	1,000	53/63	1, 2	High-Voltage Open-Drain Power MOSFET Drivers
#TC4432	X			N								
#TC96C555	X			I	18	3	3	25	1,800	140/100	2, 3	Programmable Power Oscillator with Open-Drain Output

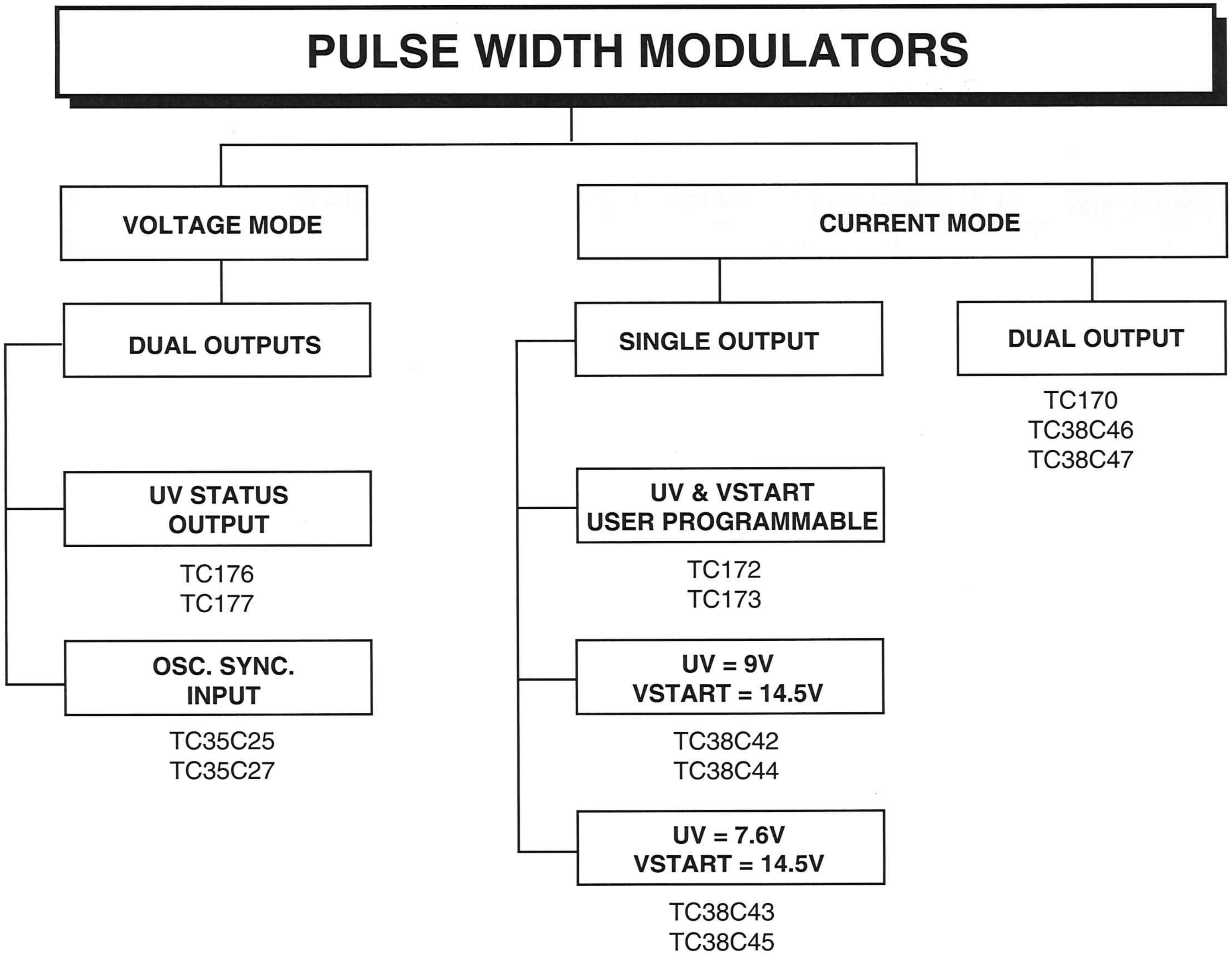
NOTES:
I = Inverting Outputs
B = Both (one I/one N)
N = Non-Inverting Outputs
# = New Products
1. 8 PIN SO
2. 8 PIN DIP
3. 16 PIN SO
4. 5-PIN to 220
5. 14 PIN DIP

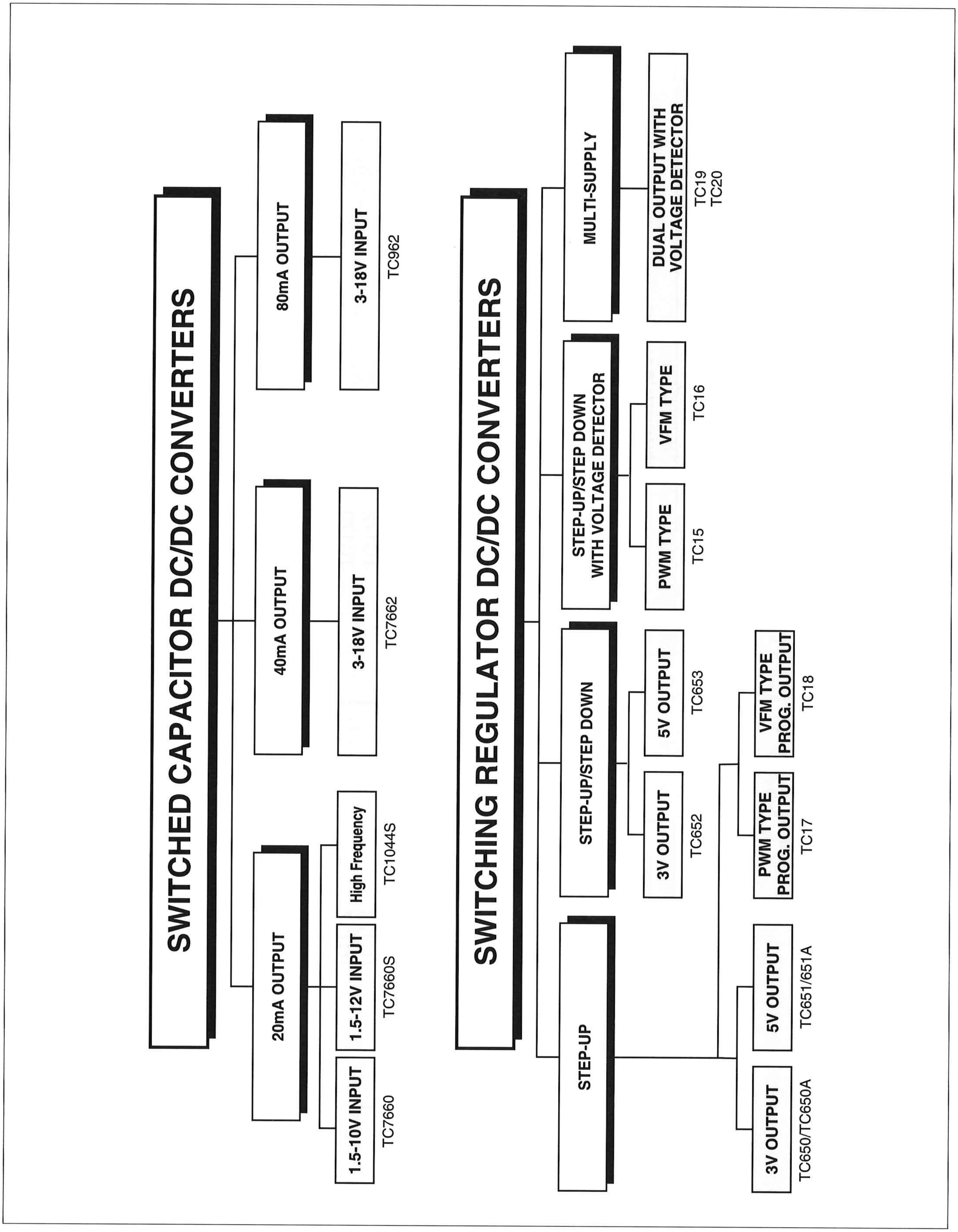
TELCOM POWER DRIVER FEATURES (Cont.)

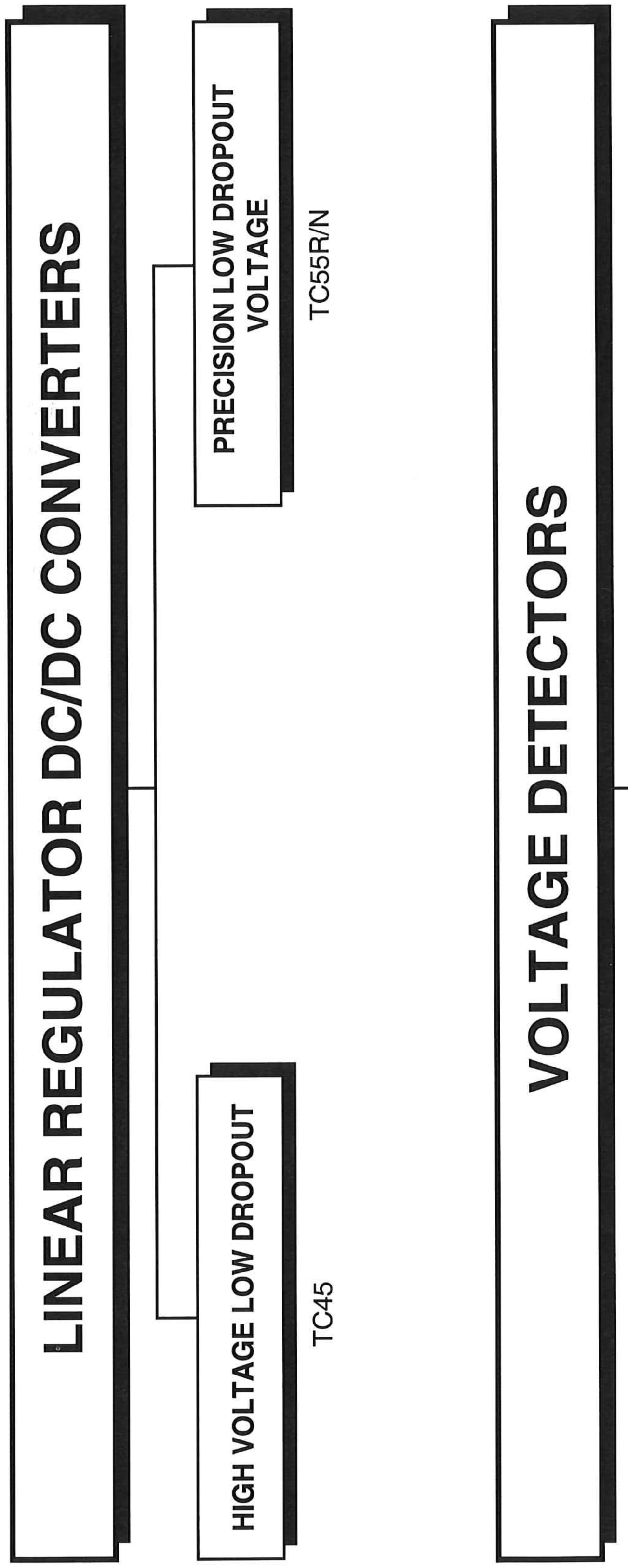
Typical 25°C Parameters

Part #	Single	Dual	Quad	Output Logic	Max. Oper. Voltage (V)	Max. Supply Current Is (mA)	Peak Current Ipk (A)	Switch Speed (nS)	Load Capacitance CL (pF)	Input to Output Delay tD1/tD2 (nS)	Package	Description	
TC4626 TC4627	X X			I N	6	2.5	1.5	33	1,000	35/45	2, 3	Power MOSFET Drivers with 2VDD Booster	
# TC4803 # TC4804	X X			I N	18	8	1.4	40	1,000	133/200 110/155	2	Power MOSFET Drivers with Opto-Isolation of 2,500 VRMS	
												Input Logic	**Description**
TC4437 TC4438 TC4439			X X X	I N N	18	4	1.2	15	470	40/40	3, 5	2 Input NAND 2 Input and 1 (+) & 1(-) and	Power MOSFET Drivers with Logic Input and Open Drain Pull-Down Only Outputs
TC4467 TC4468 TC4469			X X X	I N N	18	4	1.2	15	470	40/40	3, 5	2 Input NAND 2 Input and 1 (+) & 1(-) and	Power MOSFET Drivers with Logic Input and Standard Push-Pull Outputs
TC4457 TC4458 TC4459			X X X	I N N	18	4	1.2	15	470	40/40	3, 5	2 Input NAND 2 Input and 1 (+) & 1(-) and	Power MOSFET Drivers with Logic Input and Open Drain Pull-Down Only Outputs with Diode Clamp to VDD
TC4487 TC4488 TC4489			X X X	I N N	18	4	1.2	15	470	40/40	3, 5	2 Input NAND 2 Input and 1 (+) & 1(-) and	Power MOSFET Drivers with Logic Input and Open Drain Pull-Up Only Outputs

NOTES:
I = Inverting Outputs
N = Non-Inverting Outputs
# = New Products
1. 8-Pin SO
2. 8-Pin DIP
3. 16-Pin SO
4. 5-Pin to 220
5. 44-Pin DIP


PULSE WIDTH MODULATORS
VOLTAGE MODE
CURRENT MODE
DUAL OUTPUTS
UV STATUS OUTPUT
TC176
TC177
OSC. SYNC. INPUT
TC35C25
TC35C27
SINGLE OUTPUT
UV & VSTART USER PROGRAMMABLE
TC172
TC173
UV = 9V VSTART = 14.5V
TC38C42
TC38C44
UV = 7.6V VSTART = 14.5V
TC38C43
TC38C45
DUAL OUTPUT
TC170
TC38C46
TC38C47


SWITCHED CAPACITOR DC/DC CONVERTERS
20mA OUTPUT
1.5-10V INPUT
TC7660
1.5-12V INPUT
TC7660S
High Frequency
TC1044S
40mA OUTPUT
3-18V INPUT
TC7662
80mA OUTPUT
3-18V INPUT
TC962
SWITCHING REGULATOR DC/DC CONVERTERS
STEP-UP
3V OUTPUT
TC650/TC650A
5V OUTPUT
TC651/651A
PWM TYPE PROG. OUTPUT
TC17
VFM TYPE PROG. OUTPUT
TC18
STEP-UP/STEP DOWN
3V OUTPUT
TC652
5V OUTPUT
TC653
STEP-UP/STEP DOWN WITH VOLTAGE DETECTOR
PWM TYPE
TC15
VFM TYPE
TC16
MULTI-SUPPLY
DUAL OUTPUT WITH VOLTAGE DETECTOR
TC19
TC20


LINEAR REGULATOR DC/DC CONVERTERS
HIGH VOLTAGE LOW DROPOUT
TC45
PRECISION LOW DROPOUT VOLTAGE
TC55R/N
VOLTAGE DETECTORS
STANDARD RANGE 0.9–3.0V
TC44/TC44LV
EXTENDED RANGE 1.1–6.0V
TC54

PWM CONTROLLERS ICs

TelCom Semiconductor's family of PWM CMOS ICs for power supply control applications require only 1/8 of the power of bipolar equivalents. Voltage or current-mode, in either single or dual ended configurations are available in dual-in-line or surface mount packages.

TelCom Semiconductor's proprietary Tough CMOS™ construction featured on many of these devices, provides input and output latch-up and ESD protection to 4kV, as well as much lower power consumption than any of their previous CMOS or bipolar counterparts.

Typical 25°C Parameters

Part #	Mode C/V	Active Output H/L	Switch Speed in ns	Load Capacitance CL (pF)	Max. Oper. Voltage (V)	Max. Osc. Freq. (MHz)	Supply Current (mA)	Start Up Current (µA)	No. of Outputs	Osc. Pin Out.	UV Ind. Pin Out.	Shut Down Pin Input	Notes
TC170	C	H	50	1,000	16	0.5	2.7	150	2	X		X	Duty cycle limit to 49% per output
TC172	C	H	40	1,000	18	0.5	1.0	100	1		X	X	Programmable start-up and dropout threshold
TC173	C	H	40	1,000	18	0.5	1.0	100	1		X	X	Programmable start-up and dropout threshold; 49% duty C. limit
# TC176	V	H	50	1,000	16	0.5	1.0	75	2		X	X	Duty cycle limit to 49% per output
# TC177	V	L	50	1,000	16	0.5	1.0	75	2		X	X	Same as TC176
TC38C42	C	H	35	1,000	18	0.5	1.0	170	1				Start-up/UV Lockout of 14.5V/9V
TC38C43	C	H	35	1,000	18	0.5	1.0	170	1				Start-up/UV Lockout of 8.4V/7.6V
TC38C44	C	H	35	1,000	18	0.5	1.0	170	1				Start-up/UV Lockout of 14.5V/9V; 49% duty cycle limit
TC38C45	C	H	35	1,000	18	0.5	1.0	170	1				Start-up/UV Lockout of 8.4V/7.6V; 49% duty cycle limit
TC35C25	V	H	50	1,000	16	0.5	2.0	75	2	X		X	Duty cycle limit to 49% per output
TC35C27	V	L	50	1,000	16	0.5	2.0	75	2	X		X	Same as TC35C25
# TC38C46	C	H	50	1,000	18	0.5	1.5	250	2	X		X	Duty cycle limit to 49% per output
# TC38C47	C	L	50	1,000	18	0.5	1.5	250	2	X		X	Same as TC38C46

NOTES: C = Current
V = Voltage
H = High
L = Low

The TC38CXX is also available for military and industrial temperature range.

DC-TO-DC CONVERTER ICs

Three types of DC-to-DC converter ICs are available from TelCom Semiconductor: switched capacitor converters switching mode regulators and linear regulators. Switched capacitor DC-to-DC converters are high-efficiency converters for use as voltage inverters, splitters or multipliers. Switched capacitor DC-to-DC converters are ideal for embedded applications to a maximum of 100mA.

Switched Capacitor DC-to-DC Converter

Part #	Output Current (mA)	Input Range (V)	Output Impedance (Ω)	Comments
TC962	80	3–18	28	Highest Output Current, Frequency Doubler for Smaller Capacitors
# TC1044S	20	1.5–12	55	60kHz Oscillator Frequency
TC7660	20	1.5–10	55	Low I_{CC} of 80µA
# TC7660S	20	1.5-12	55	Extended Input Voltage Range
TC7662A	40	3–18	40	High Output Current

= New Product

Switching Regulators

	Part #	Input Range (V)	Output Range (V)	Output Current Range	Voltage Detect	Function	Package
#	**TC650**	1.0–6	3	40–120mA	N	Step-up DC/DC	SOT-89
#	**TC650A**	0.9–2	3	40–120mA	N	Step-up DC/DC	SOT-89
#	**TC651**	1.0–6	5	40–120mA	N	Step-up DC/DC	SOT-89
#	**TC651A**	0.9–2	5	40–120mA	N	Step-up DC/DC	SOT-89
#	**TC652**	1.2–8	3	1–40mA	N	Step-up/Step-down Series/Switching Regulator	SO-8
#	**TC653**	1.2–8	5	1–40mA	N	Step-up/Step-down Series/Switching Regulator	SO-8
#	**TC15**	0.9–10	-0.3–12	250mA	Y	Step-up/Step-down PWM Type	SO-8
#	**TC16**	0.9–10	-0.3–12	250mA	Y	Step-up/Step-down VFM Type	SO-8
#	**TC17**	0.8–8	3–8	10–250mA	N	PWM Step-up	SOT-89
#	**TC18**	0.8–8	3–8	10-250mA	N	VFM Step-up	SOT-89
#	**TC19**	1.5–10	3–6 & 2–6	150mA	Y	Multi-power Supply System	SO-16
#	**TC20**	1.2–6	-0.3–6 & -0.3–12	200mA	Y	Multi-power Supply System	SO-24

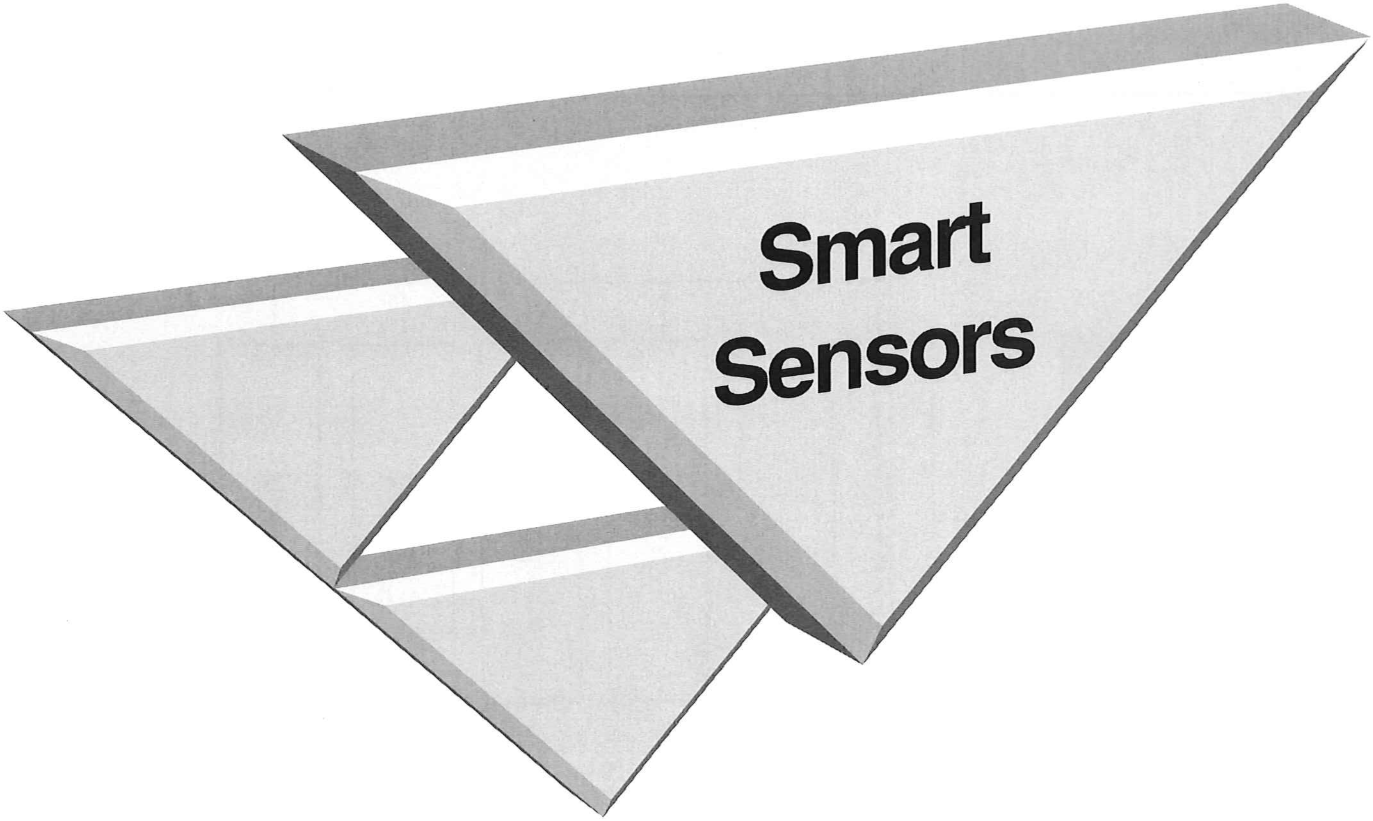
Linear Regulators

	Part #	Input Range (V)	Output Range (V)	Output Current Range	Accuracy	Function	Package
#	**TC45R**	2.0–10	2.0–6.0	150mA	2.5%	Low Dropout of 60mV Typ @ 1mA	SOT-89/TO-92
#	**TC45ER**	2.0–10	2.0–6.0	150mA	2.5%	Low Dropout of 0.5V Typ @ 60mA	SOT-89/TO-92
#	**TC45LR**	2.0–10	2.0–6.0	150mA	2.5%	Low Dropout of 30mV Typ @ 1mA	SOT-23-5
#	**TC55R**	1.2–10	1.1–9.9	250mA	2.0%	Low Dropout of 120mV @ 100mA	SOT-23/SOT-89

VOLTAGE DETECTORS

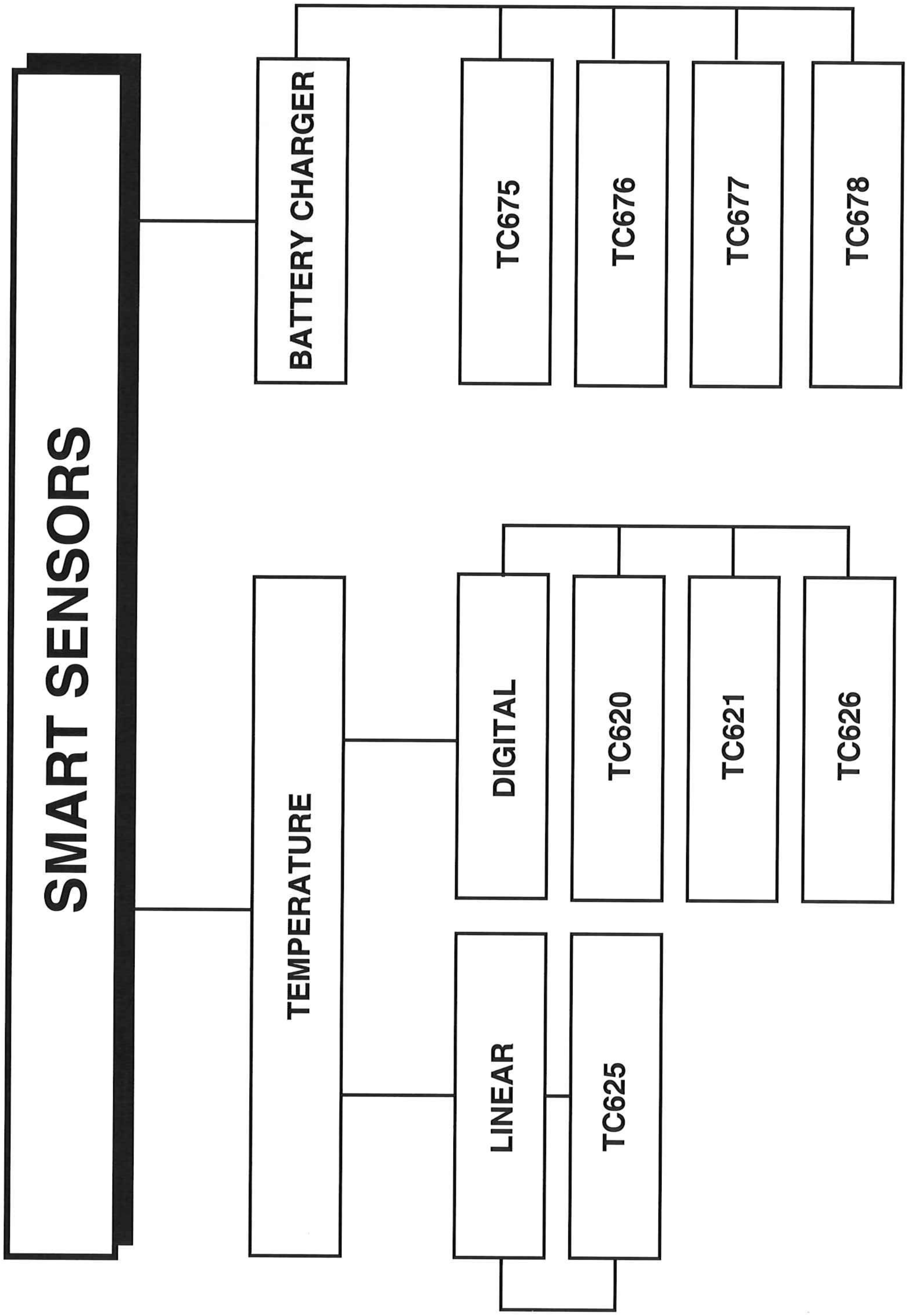
	Part #	Precision	Operating Voltage Range	Voltage Detect Range	Output Options	Package
#	**TC44V**	2.5%	1.5–10.0	1.1–6.0	P/N-Channel Open Drain, CMOS	SOT23-5/SOT89/TO-92
#	**TC44LV**	2.5%	0.7–10.0	0.9–3.0	N-Channel Open Drain, CMOS	SOT23-5
#	**TC54V**	2%/1%	1.0–6.0	1.1–6.0	N-Channel Open Drain, CMOS	SOT23, SOT89/TO-92

= New Product



Smart Sensors

- ▼ **Sensors**
- ▼ **Battery Chargers**


SMART SENSORS
BATTERY CHARGER
TC675
TC676
TC677
TC678
TEMPERATURE
DIGITAL
TC620
TC621
TC626
LINEAR
TC625

SOLID-STATE THERMAL MANAGEMENT ICs

TelCom's solid-state temperature sensors protect sensitive components such as microprocessors, power supplies, motor drives and laser diodes from excessive heat, and control temperature in process control applications.

TC620 and TC621 offer two set points which are determined by external resistors. For example, one set point can be used as a fan control or thermal warning alarm, with the second set point used as a fail-safe shutdown. Process control applications use the TC620 or TC621 to maintain low and high temperature limits.

The TC625 sensor features a duty-cycle modulated square-wave output voltage with a linear response to temperatures in the –45°C to +130°C range. The output is a digital representation of a linear temperature signal.

The TC626 is a solid-state thermal switch which is designed to replace mechanical switches in temperature-sensing applications. The TC626 output will switch to the high state when the internally programmed temperature limit is exceeded.

Part #	Temperature Sensor	Set Points	Absolute Accuracy (°C)	Set Point Range (°C)	Output Current (mA)	Supply Voltage (V)	Supply Current (µA) Max	Package
TC620	On-Chip	2	±3	-55°C~+125°C	1	4.5-18	200	8-Pin DIP, SOIC
TC621	External	2	±3	Set by Thermistor	10	4.5-18	200	8-Pin DIP, SOIC
# TC625	On-Chip	Linear	±1.2	-45°C~+130°C	N/A	4.75–7	200	TO-92, TO-220, SOIC
TC626	On-Chip	1	±3	+25°C~+120°C	10	4.5-18	600	TO-92, TO-220

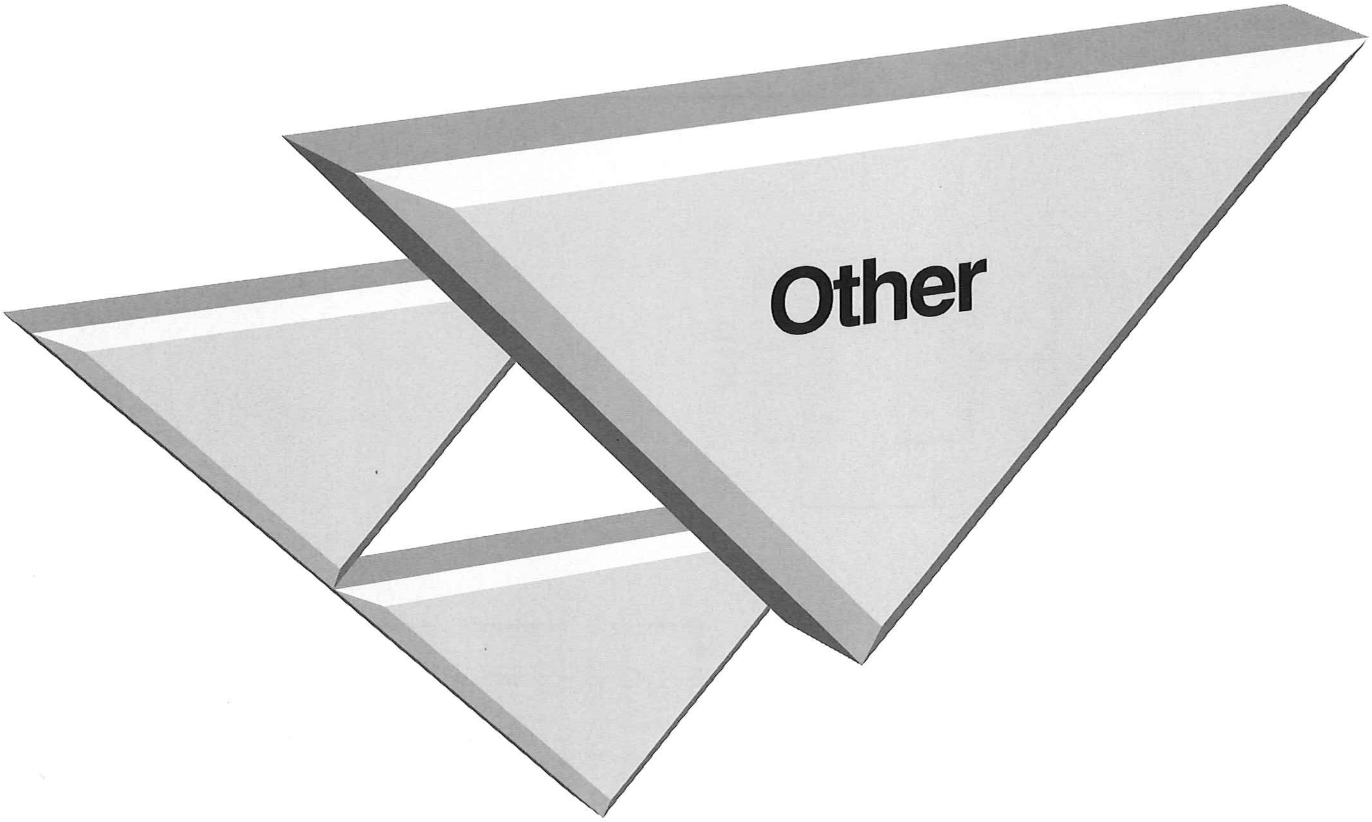
BATTERY CHARGER CONTROL ICs

The TC675 - TC678 are battery charger control ICs designed for fast charging of one to ten NiCad batteries. Battery charge status is monitored by an external thermistor, with an on-chip 1-1/2 hour maximum charge timer for NIMH added protection. An external SCR controls switching current, and an LED indicates the fast-charge mode. After completion of the fast-charge cycle, the charger automatically switches to trickle-charge mode. Batteries can be charged from 50Hz or 60Hz AC, or from a DC source.

The TC680 controls the very fast (15-20 min.) charging of NiCad/NiMH batteries. The fast charge cycle is terminated when the peak battery voltage is reached, which minimizes battery damage due to overcharging. The TC680 also displays the battery's peak voltage during charging. Multiplexed BCD outputs provide an easy interface to LCD or LED displays.

Part #	Supply Voltage (V Min)	Fast Charge Termination	Fast-Charge Time	Reset Option	Package
TC675	4.5	delta T	15 MINS. – 1 1/2 HR. (50Hz)	Trickle-Charge	14-Pin DIP, 16-PinSO
TC676	4.5	delta T	15 MINS. – 1 1/2 HR. (60Hz)	Fast-Charge	14-Pin DIP, 16-PinSO
# TC677	4.5	delta T	15 MINS. – 1 1/2 HR. (50Hz)	Trickle-Charge	14-Pin DIP, 16-PinSO
# TC678	4.5	delta T	15 MINS. – 1 1/2 HR. (50Hz)	Fast-Charge	14-Pin DIP, 16-PinSO
# TC680	4.5	Peak V	15 MINS. (Programmable)	Fast Charge	40-pin DIP, 44-pin Flat, PLCC

= New Product



▼ Signal

- Op Amps

▼ IC*

- Hi-Nil
- Analog Switches
- Display Drivers

▼ DMOS*

- Lateral
- Vertical
- CDG

▼ MCM*

- Hybrid
- Modules

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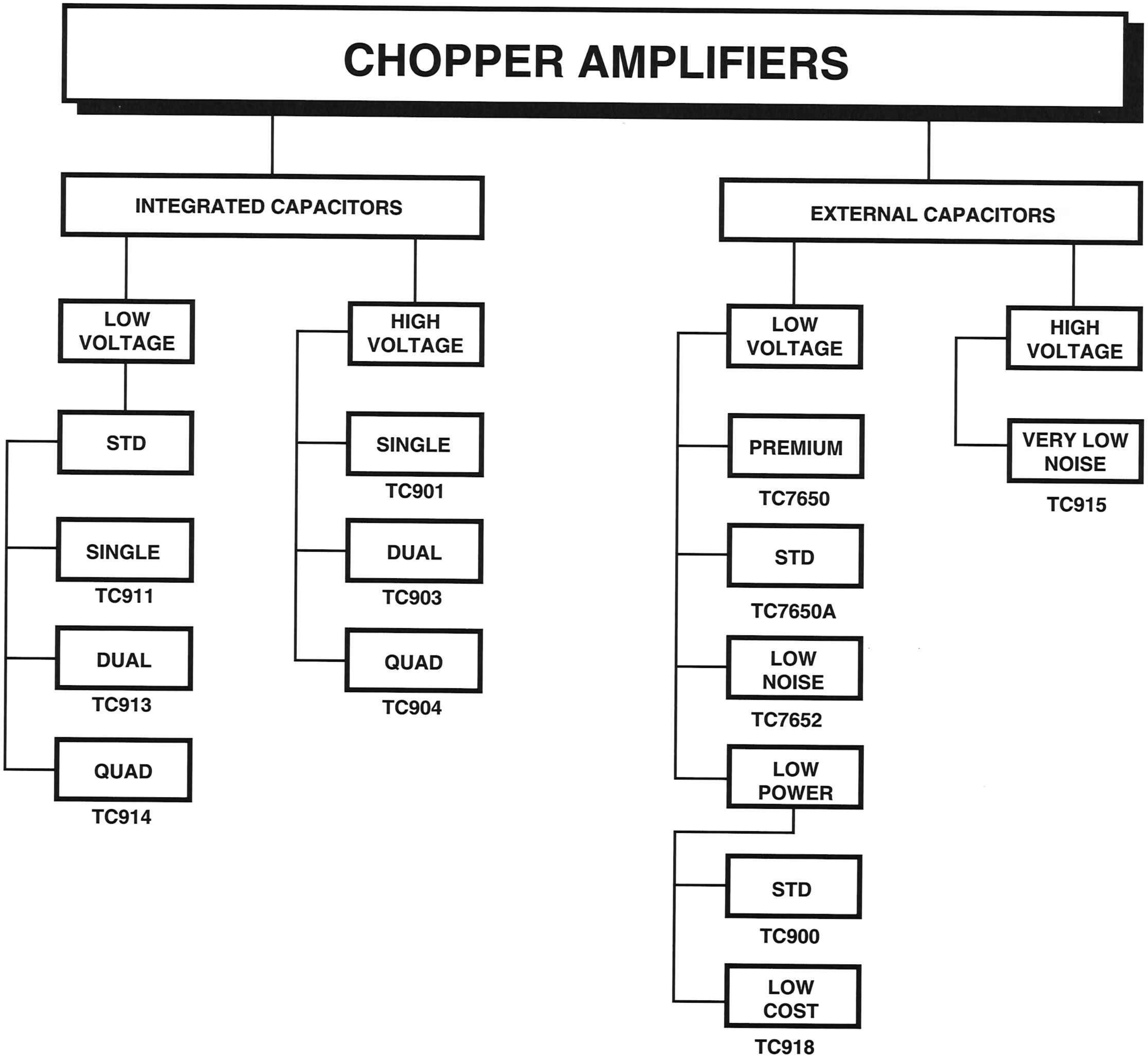
* Included in 1992 Data Book


CHOPPER AMPLIFIERS
INTEGRATED CAPACITORS
EXTERNAL CAPACITORS
LOW VOLTAGE
STD
SINGLE
TC911
DUAL
TC913
QUAD
TC914
HIGH VOLTAGE
SINGLE
TC901
DUAL
TC903
QUAD
TC904
LOW VOLTAGE
PREMIUM
TC7650
STD
TC7650A
LOW NOISE
TC7652
LOW POWER
STD
TC900
LOW COST
TC918
HIGH VOLTAGE
VERY LOW NOISE
TC915

CHOPPER STABILIZED OPERATIONAL AMPLIFIERS

TelCom Semiconductor's family of monolithic chopper stabilized operational amplifiers offer low power, precision performance in thermocouple, thermistor, strain gauge and data acquisition applications. TelCom's proprietary Tough CMOS™ process gives the user a choice between fully integrated capacitors or the standard external capacitor configuration.

Low-Power Chopper Stabilized

Part #	Offset Voltage		Input Current		Output Range		AOL	Unity Gain BW	Slew Rate	Supply Current	Package
	Initial (µV)	Drift (µV/°C)	Bias (pA)	Offset (pA)	(V)	(mA)	(dB)	(MHz)	(V/µs)	(mA)	
TC900A	±5	±0.05	±50	±0.5	±3.5	±0.35	120	0.7	±0.2	0.2	8-Pin DIP/SO
TC900B	±15	±0.3	±80	±0.5	±3.5	±0.35	100	0.7	±0.2	0.4	8-Pin DIP/SO
TC901	±15	±0.15	±50	±100	±13.7	±1.3	120	0.8	±2	0.45(t)	8-Pin DIP/SO
TC911A	±15	±0.15	±70	±140	±4.1	±1.4	115	1.5	±2.5	0.35(t)	8-Pin DIP/SO
TC911B	±30	±0.25	±120	±240	±4.1	±2.1	110	1.5	±2.5	0.8	8-Pin DIP/SO
TC915	±10	±0.1	±100	±200	±13.7	±1.3	120	0.5	±0.5	1(t)	8-/14-Pin DIP
TC918	±50	±0.8	±100	±0.5(t)	±3.5	±0.14	100	0.7	±0.2	0.3(t)	8-Pin DIP/SO
TC7650	±5	±0.05	±10	±20(t)	±4.7	±0.47	120	2	±2.5	2(t)	8-/14-Pin DIP
TC7652	±5	±0.05	±30	±150	±4.7	±0.47	120	0.4	±1	1(t)	8- or 14-Pin DIP

Dual Low-Power Chopper Stabilized

Part #	Offset Voltage		Input Current		Output Range		AOL	Unity Gain BW	Slew Rate	Supply Current	Package
	Initial (µV)	Drift (µV/°C)	Bias (pA)	Offset (pA)	(V)	(mA)	(dB)	(MHz)	(V/µs)	(mA)	
TC913A	±15	±0.15	±90	±180	±4.1	±2.1	115	1.5	±2.5	0.65(t)	8-Pin DIP/SO
TC913B	±30	±0.25	±120	±240	±4.1	±2.1	110	1.5	±2.5	1.1)	8-Pin DIP/SO

Quad Low-Power Chopper Stabilized

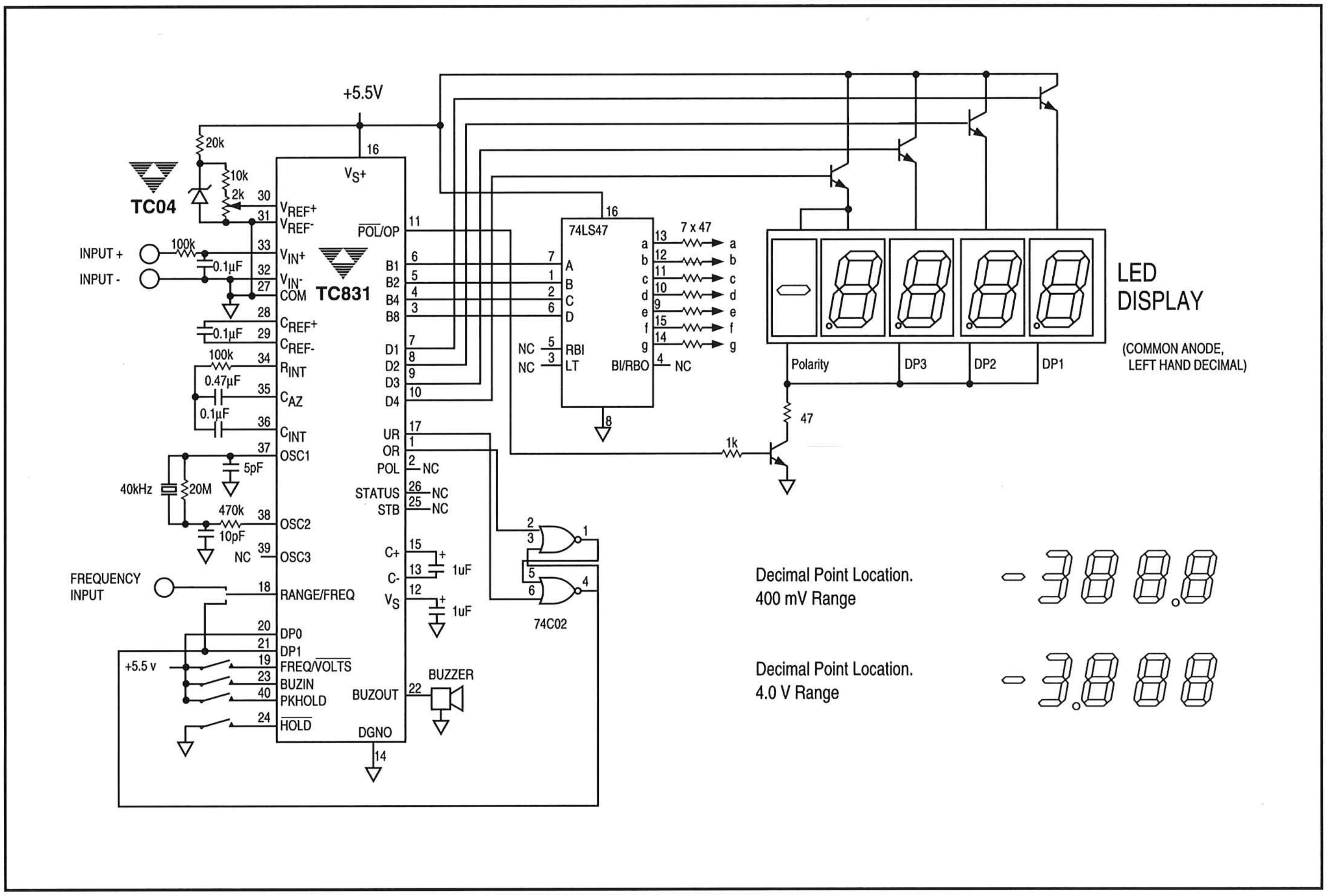
Part #	Offset Voltage		Input Current		Output Range		AOL	Unity Gain BW	Slew Rate	Supply Current	Package
	Initial (µV)	Drift (µV/°C)	Bias (pA)	Offset (pA)	(V)	(mA)	(dB)	(MHz)	(V/µs)	(mA)	
TC914	±20	±0.15	±90	±180	±2.1	±1.4	115	1.5	±2.5	1.6(t)	14-Pin DIP/16-Pin SO
TC914A	±15	±0.15	±90	±180	±2.1	±1.4	115	1.5	±2.5	1.6(t)	14-Pin DIP/16-Pin SO
TC914B	±30	±0.25	±120	±240	±4.1	±2.1	110	1.5	±2.2	1.6(t)	14-Pin DIP/16-Pin SO

NOTES: (t): denotes typical

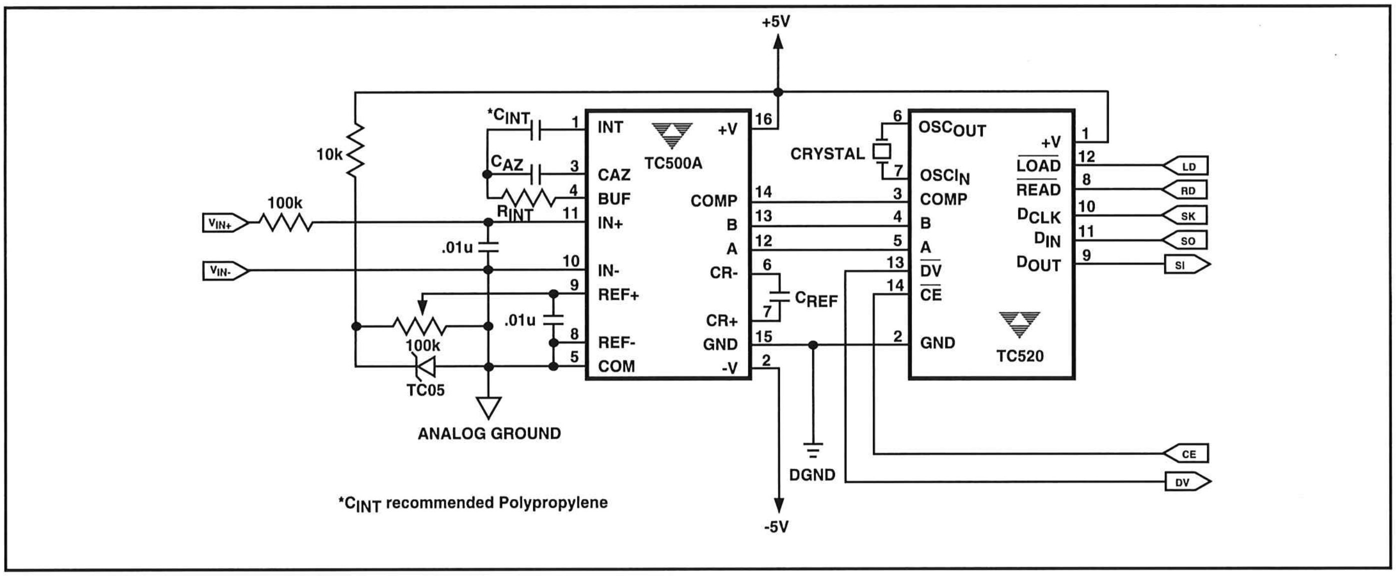
Applications

Section 3

A/D CONVERTERS

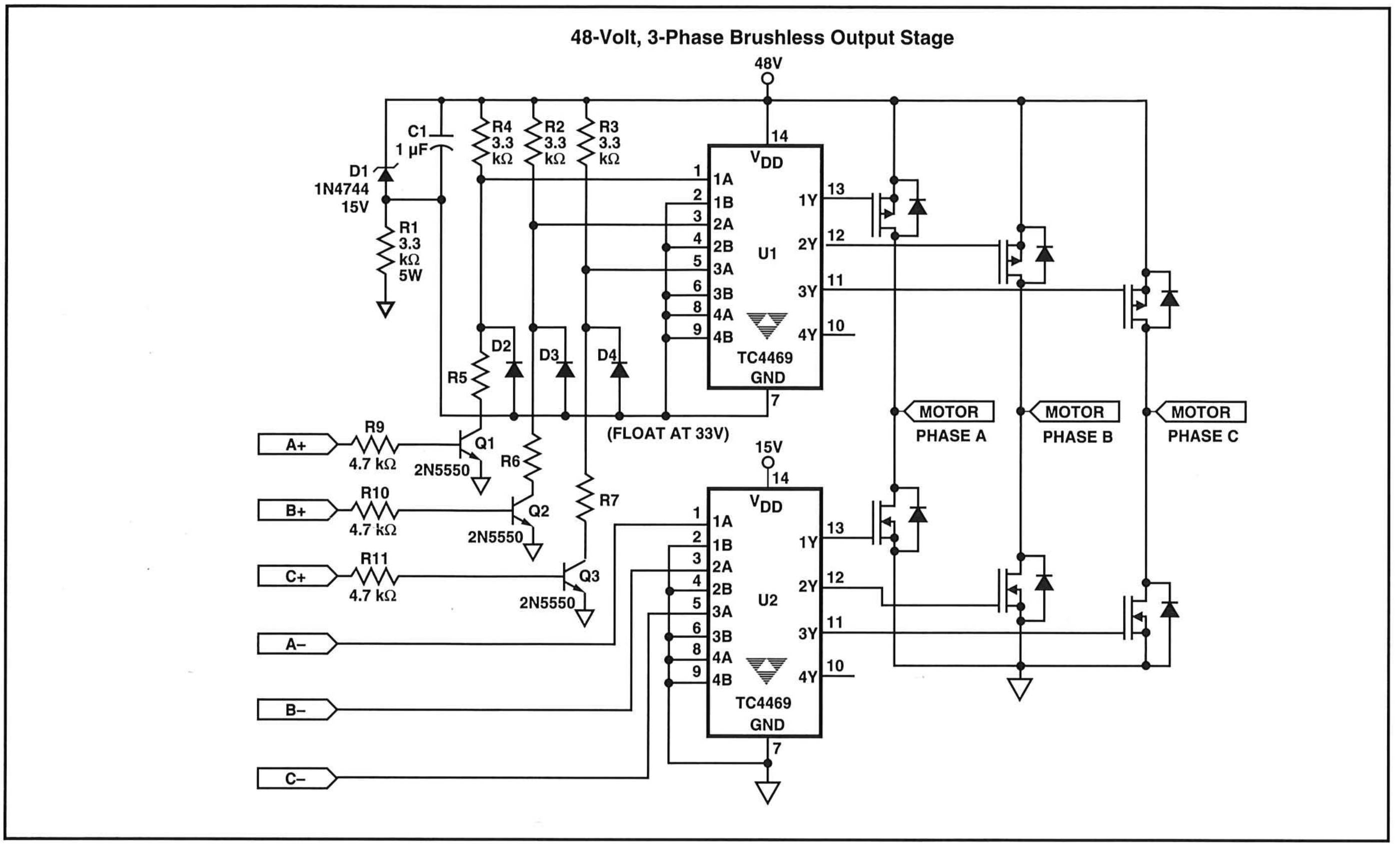


TC831, a 3-3/4 digit autoranging panel meter.

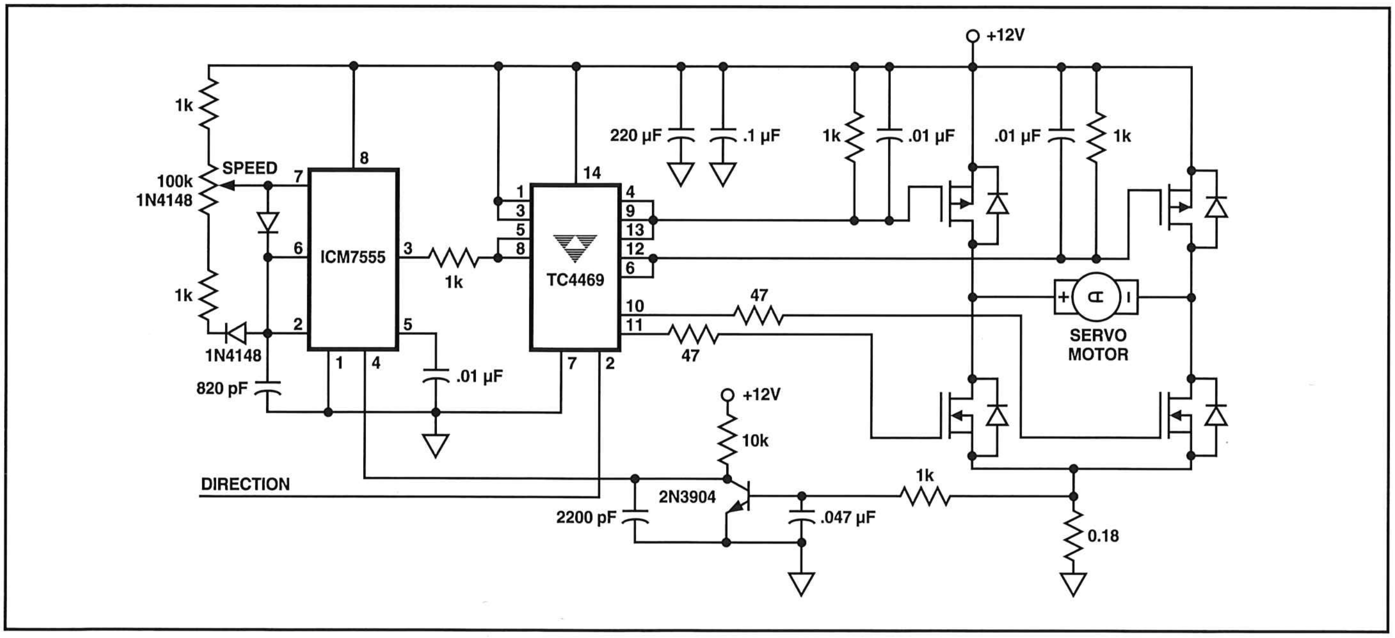


TC500/TC520 typical application circuit.

POWER DRIVERS

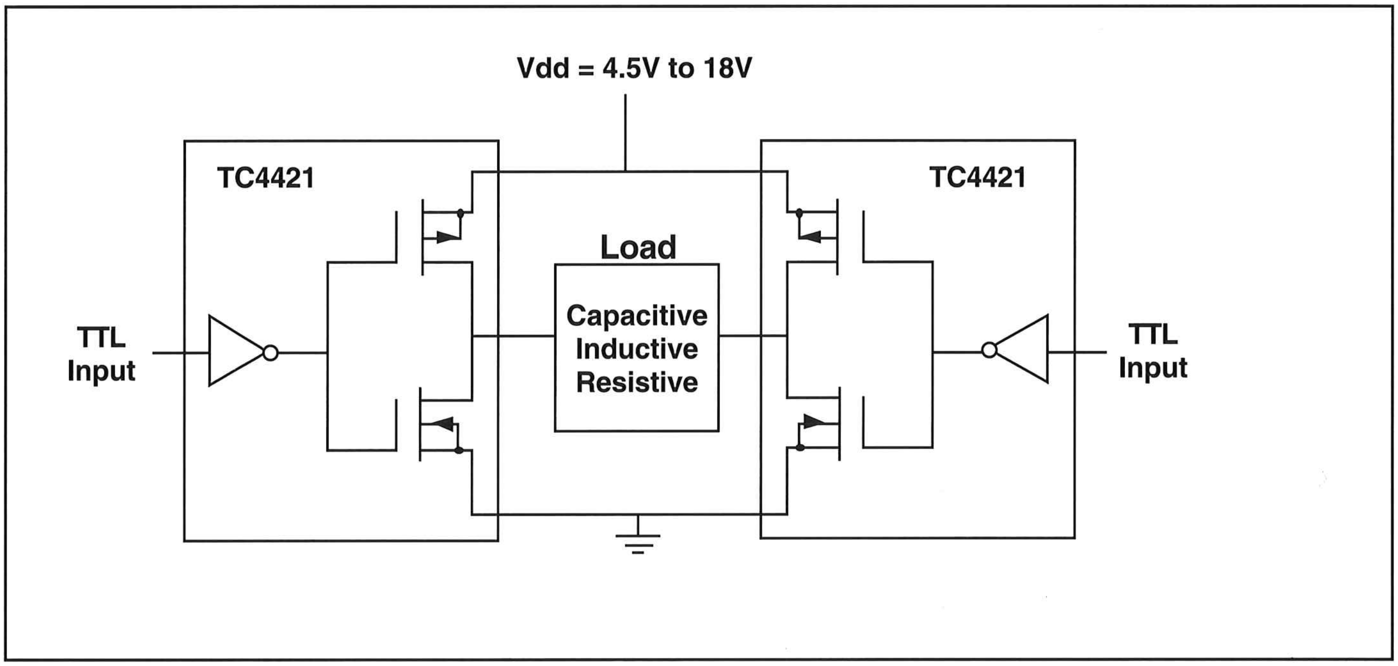


Three phase 48V motor drive circuit using TC4469.

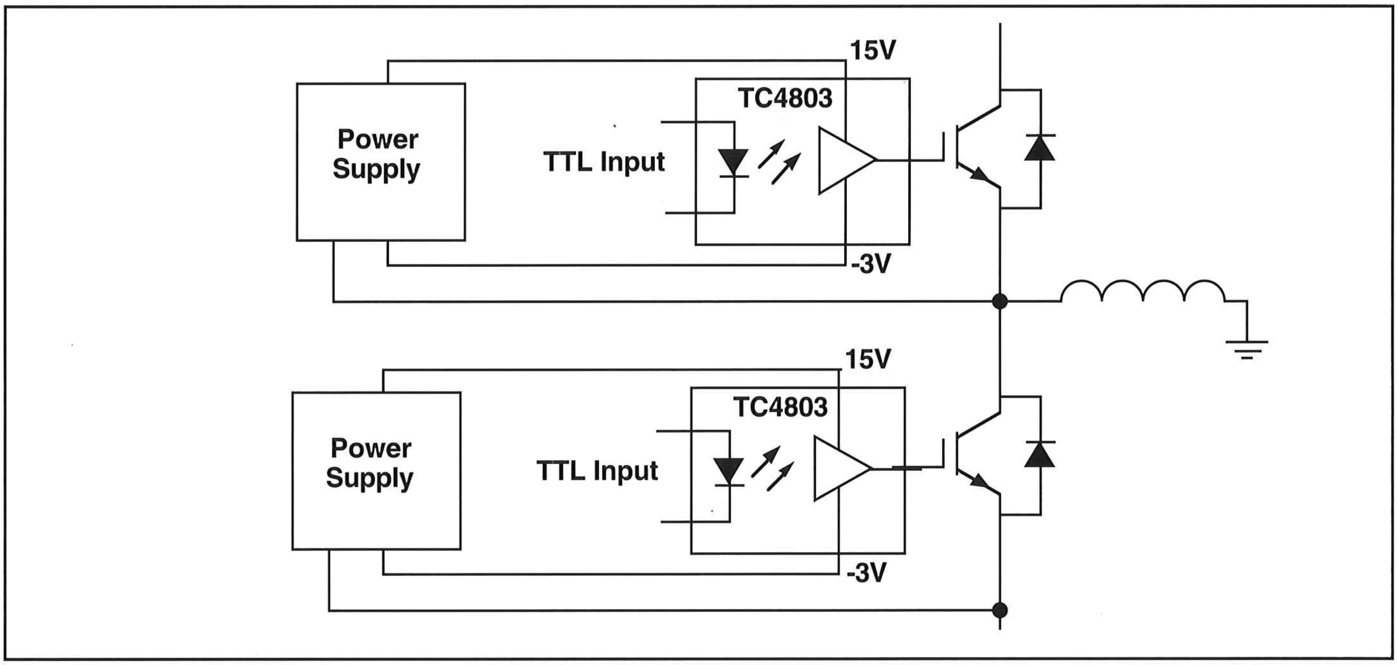


12V H-bridge motor drive circuit using TC4469.
Motor size can be varied using larger MOSFETs.

POWER DRIVERS

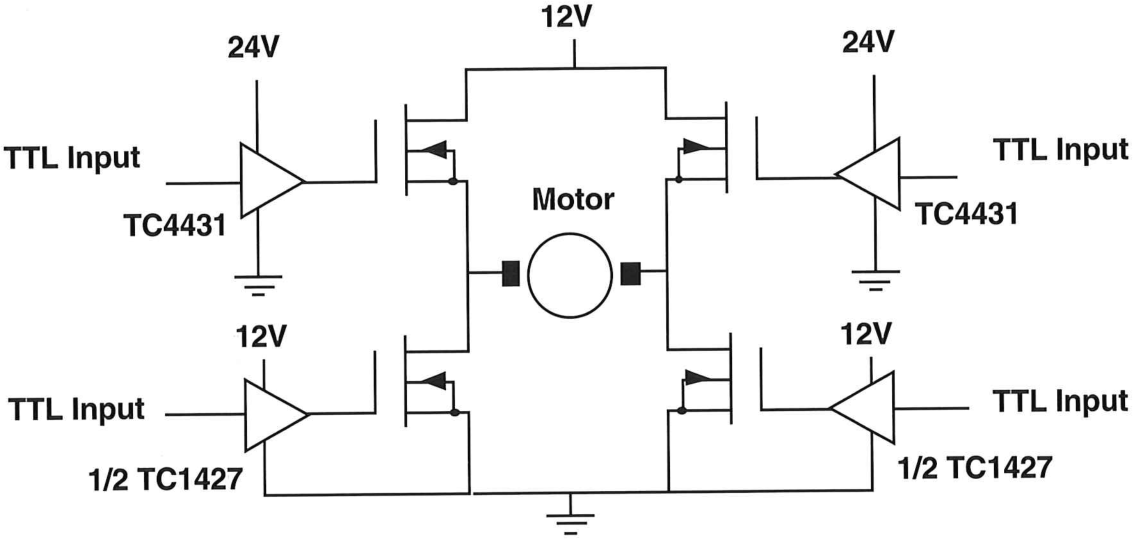


Universal 9A peak and 2A constant current H-bridge driver.
Circuit can be used to drive capacitive, inductive and resistive loads.

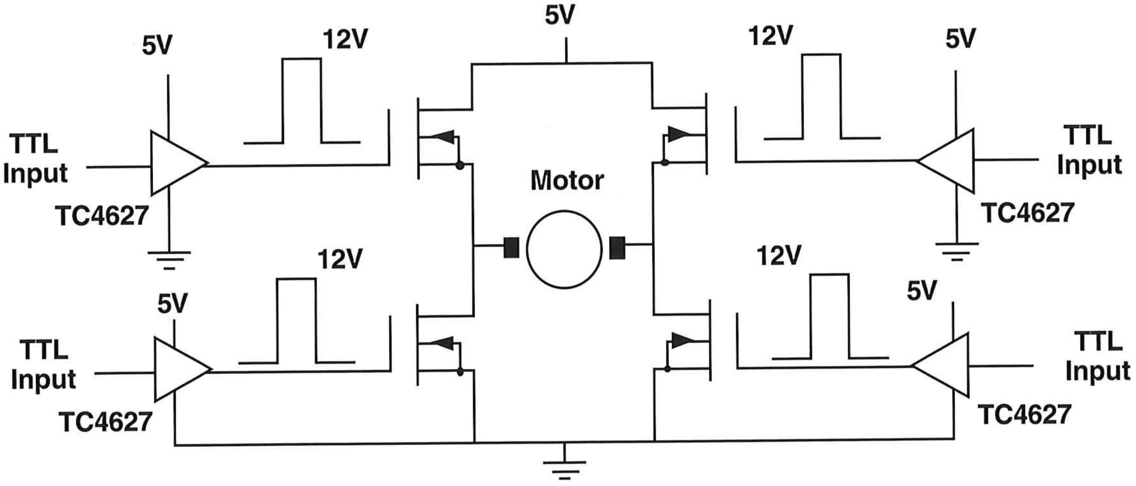


High Voltage IGBT circuit using opto-isolated mosfet drivers, TC4803.

POWER DRIVERS

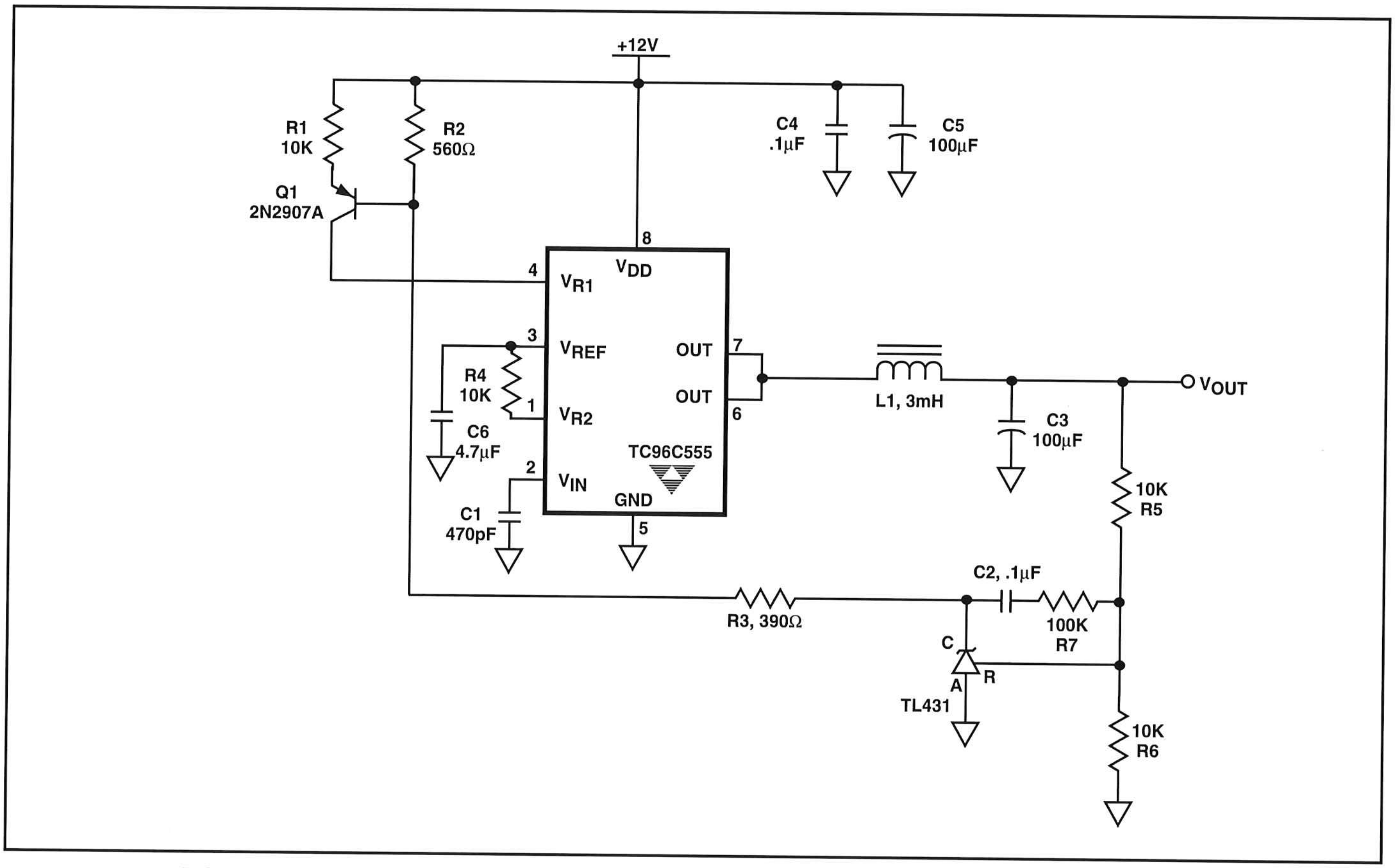


12V H-Bridge using low cost N-channel MOSFET and two 30V drivers, TC4431, and one dual driver, TC1427.

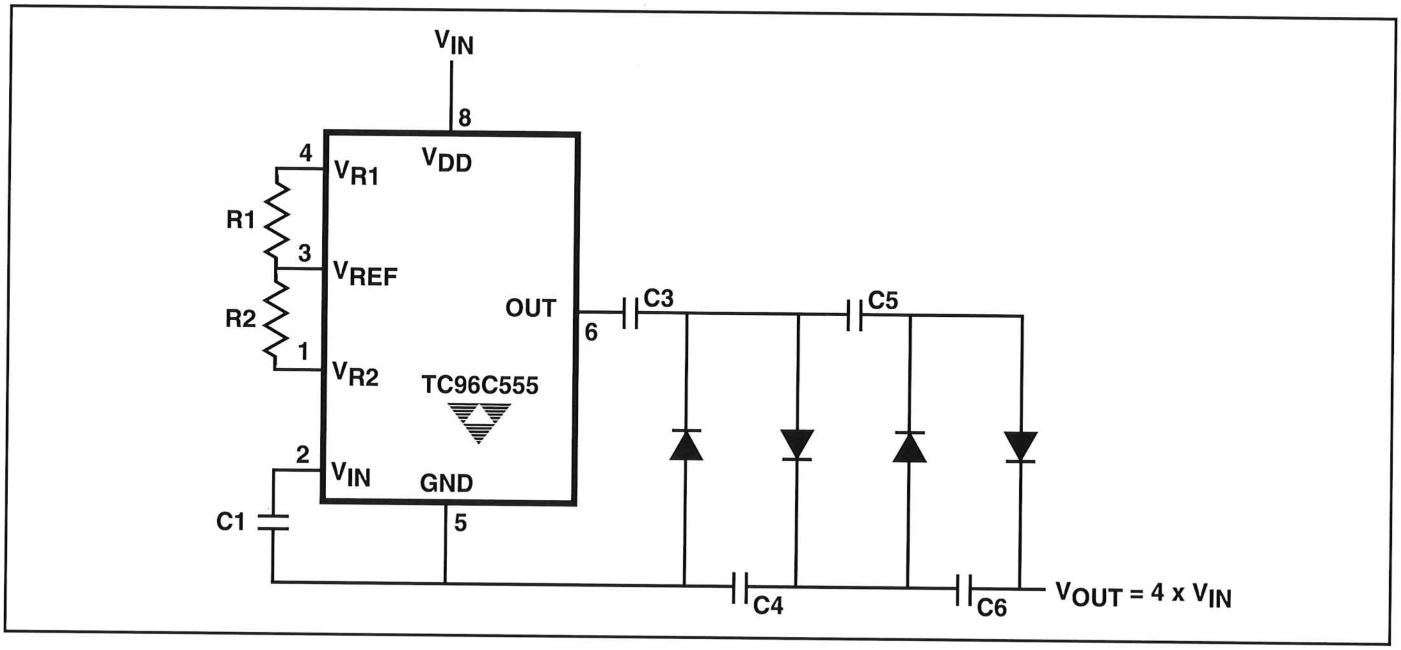


5V H-Bridge using low cost N-channel MOSFETs and 4 TC4627 boost drivers.

POWER DRIVERS



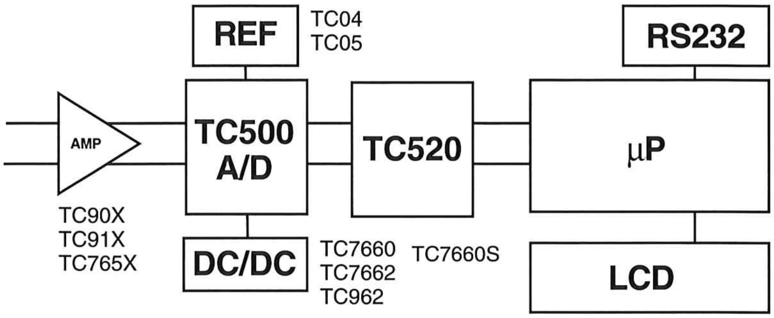
TC96C555 +5V Buck Regulator Power Supply with 84% Efficiency at 200mA Output



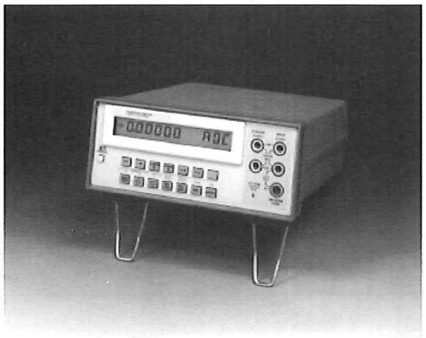
TC96C555 4X Voltage Multiplier.
Additional stages can be added to increase the multiplication.

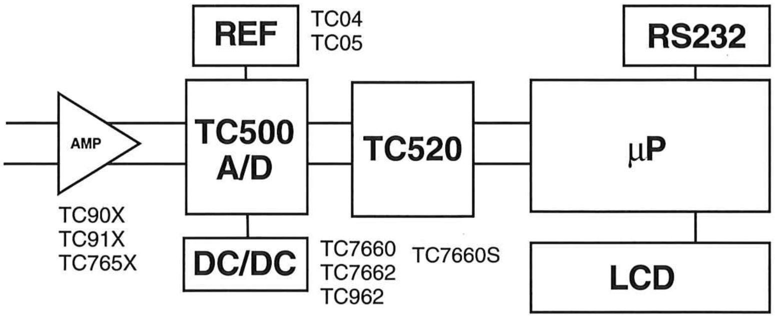
DATA ACQUISITION SYSTEMS

Industrial Scale Application

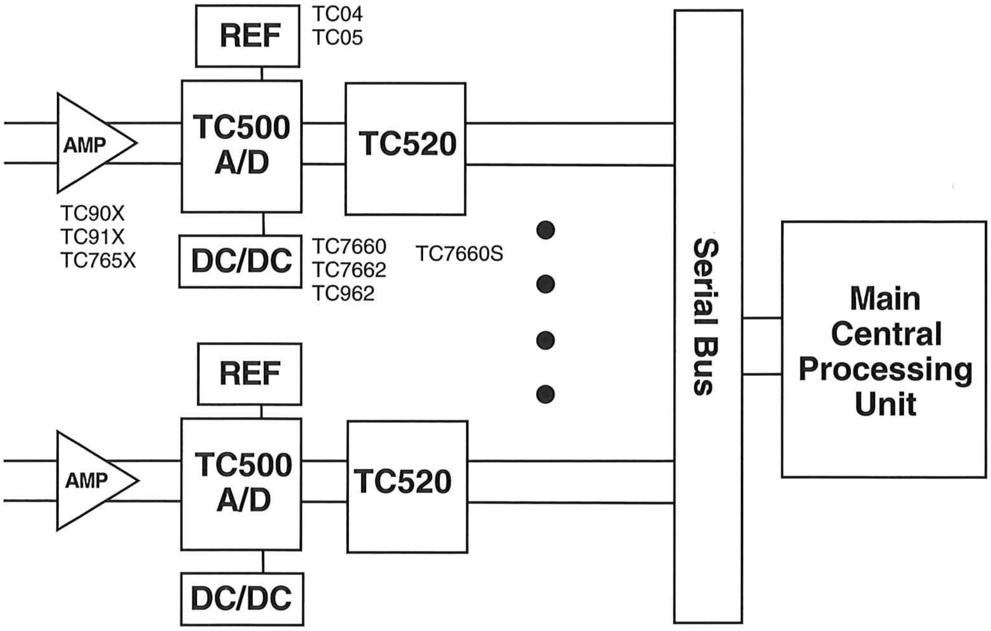


High Resolution Meter Application



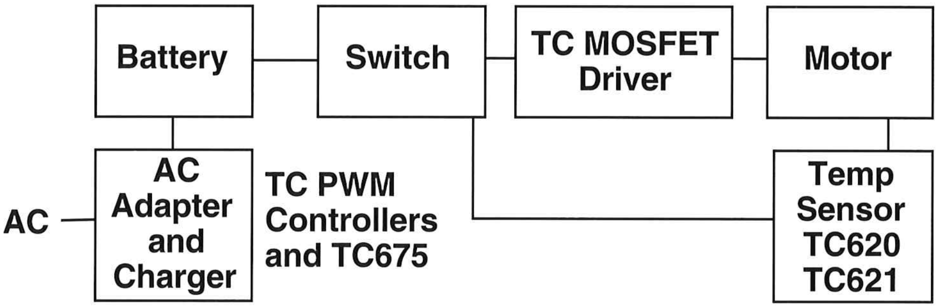


INDUSTRIAL CONTROL TYPICAL APPLICATION

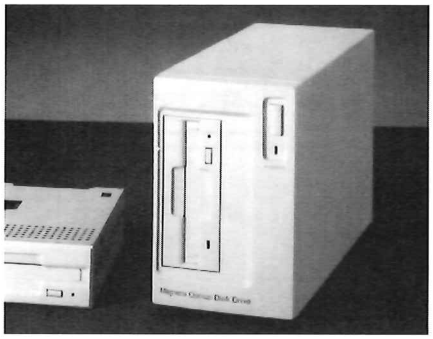


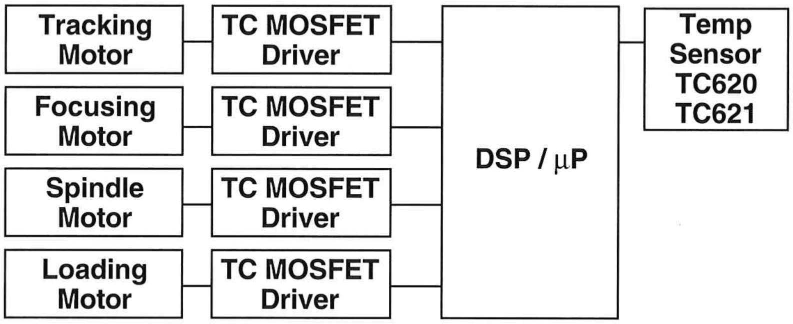
POWER MOSFET DRIVERS

Portable Drill Application

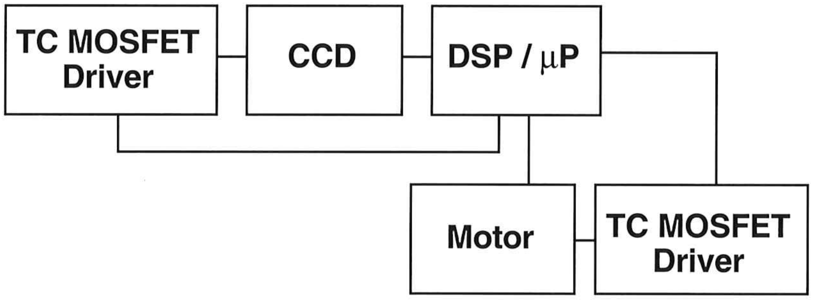


Disk Drive Application

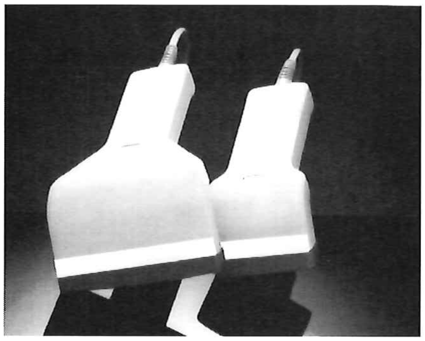


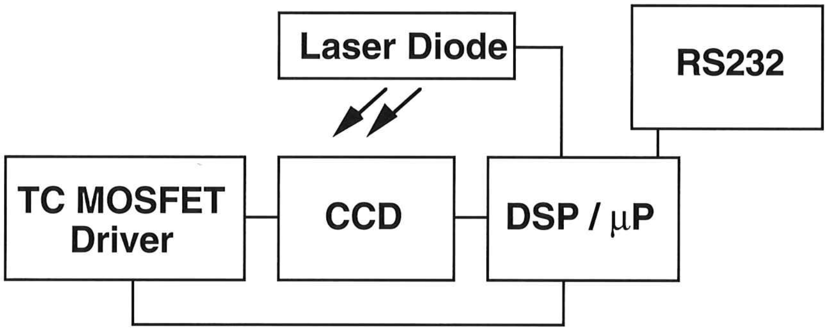


Fax Application



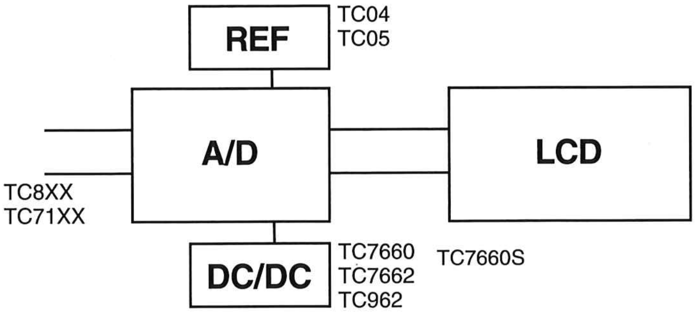
Bar Code Scanner Application



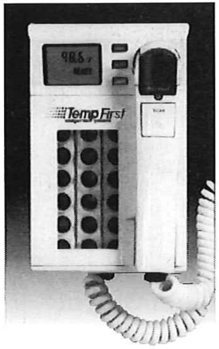


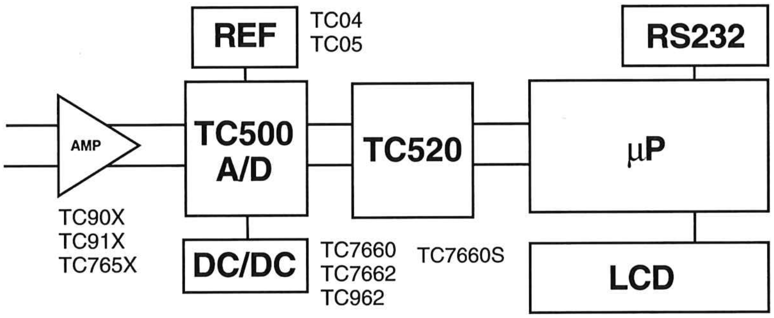
TEST EQUIPMENT

Hand-held Multimeter Application

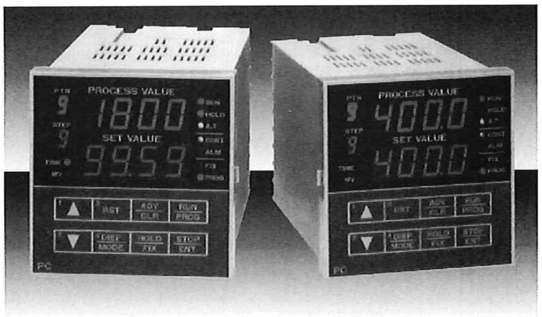


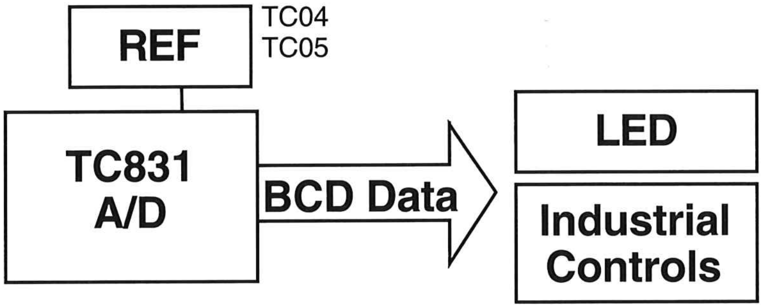
Medical Instrument Application



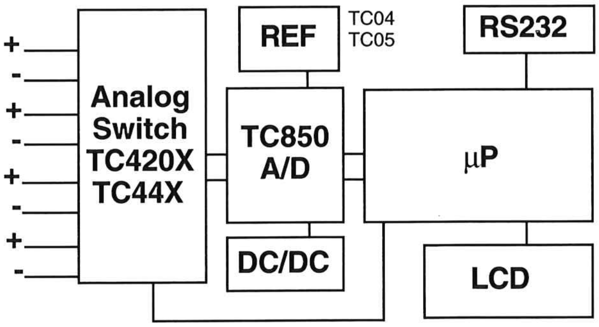


Panel Meter Application

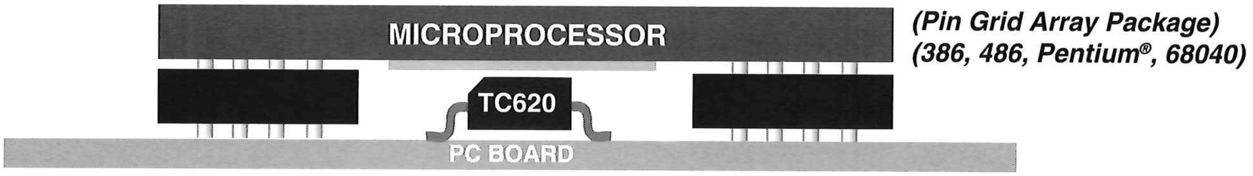




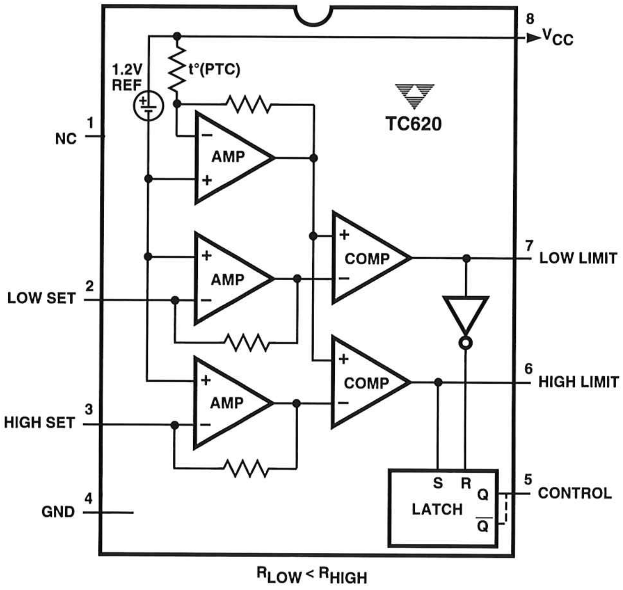
Test Equipment Application



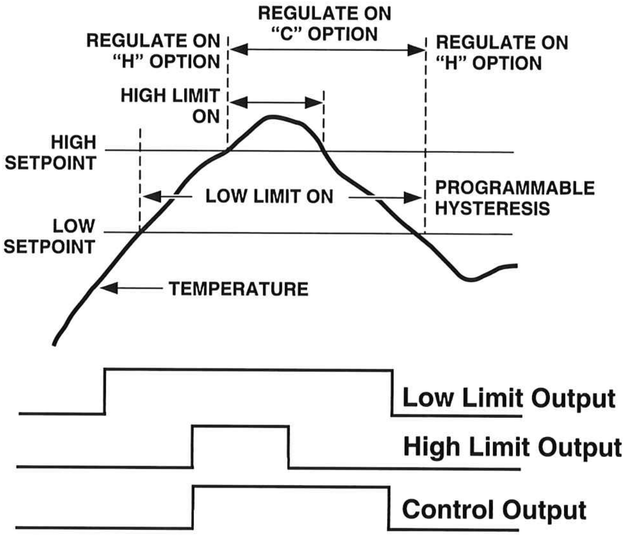
THERMAL MANAGEMENT ICs



The TC620 can help protect your precious data by letting you know if things are getting too hot !!!!

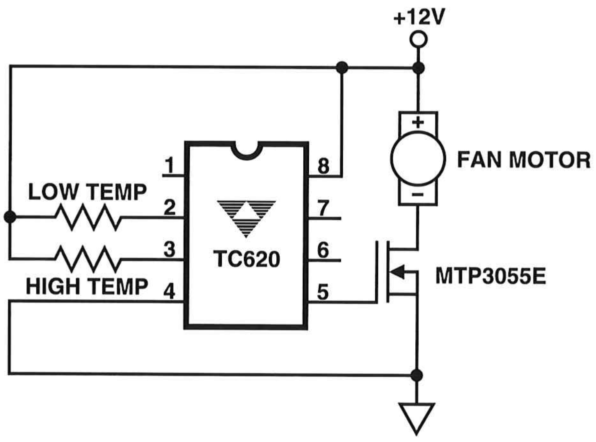


NOTE: LATCH Q is "C" (STANDARD)
LATCH $\overline{Q}$ is "H" (OPTION)

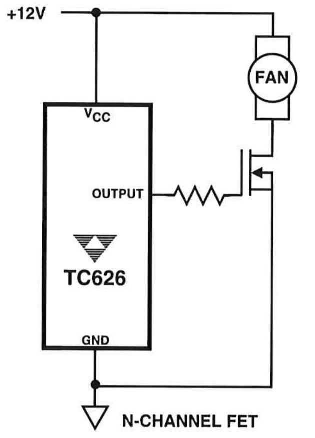


Using resistors, the TC620 can be set to give you an output from 0°C to 125°C

TC620 Thermal Control Application



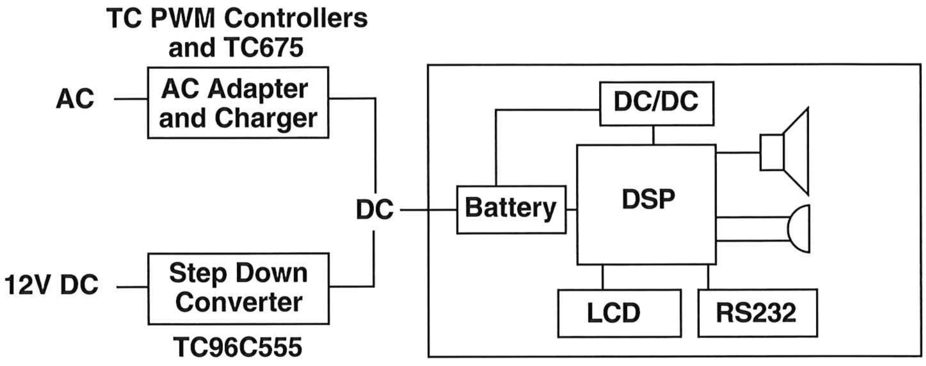
External thermistor fan control using TC620



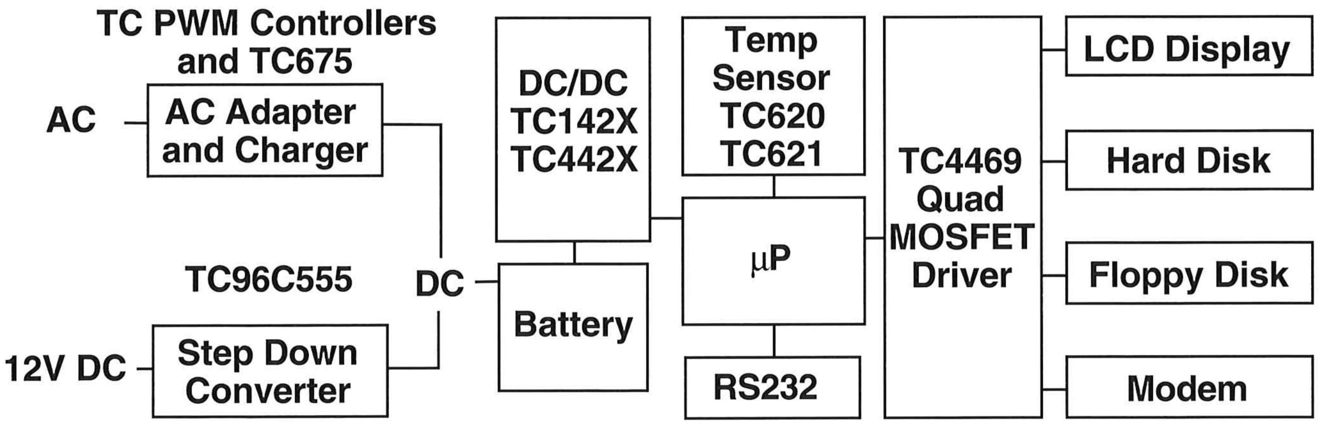
Factory programmed fan control using TC626

OFFICE AUTOMATION

Cellular Telephone Application



Laptop/Notebook Application



Cross Reference

Section 4

Cross-Reference Guide

Direct Replacement	Functional Equivalent	TelCom Part No.	Description

Analog Devices

AD232AN		TC232EPE	RS-232 Interface
AD232AR		TC232EOE	RS-232 Interface
AD232JN		TC232CPE	RS-232 Interface
AD232JR		TC232COE	RS-232 Interface
AD232SQ		TC232MJE	RS-232 Interface
	AD589JH	TC04BCZM	1.2V Voltage Reference
	AD589JR	TC04COA	1.2V Voltage Reference
	AD589KH	TC04CZM	1.2V Voltage Reference
	AD589SH	TC04BMRM	1.2V Voltage Reference
	AD589TH	TC04AMRM	1.2V Voltage Reference
	ADG202AKN	TC4202CPE	Quad-SPST Analog Switch, NO
	ADG211AKN	TC4201CPE	Quad-SPST Analog Switch, NO
	ADG212AKN	TC4202CPE	Quad-SPST Analog Switch, NC
	ADG221BQ	TC441IJE	Quad-SPST Analog Switch/Latch
	ADG221KN	TC441CPE	Quad-SPST Analog Switch/Latch
	ADG222BQ	TC442IJE	441 with Inverse Logic
	ADG222TQ	TC442MJE	441 with Inverse Logic

Cherry Semiconductor

	CS1842AJ	TC18C42MJA	SMPS Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	CS1843AJ	TC18C43MJA	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	CS2842AJ	TC28C42IJA	SMPS Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	CS2843AJ	TC28C43IOE	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	CS3842AD	TC38C42COE	SMPS Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	CS3842N	TC38C42CPA	SMPS Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	CS3843AD	TC38C43COE	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	CS3843N	TC38C43CPA	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC

Dallas Semiconductor

DS1228S		TC232COE	RS-232 Interface
DS1228		TC232CPE	RS-232 Interface
DS232		TC232CPE	RS-232 Interface

Datel

ADC-7109		TC7109CPL	12-Bit Plus Sign ADC
ADC-800		TC800CPL	15-Bit Plus Sign µp ADC
ADC-EK1		TC8702MJG	12-Bit Binary ADC
ADC-EK10B		TC8701EJG	10-Bit Binary ADC
ADC-EK12DC		TC8750CPG	3-1/2 Digit ADC, Parallel BCD Output
ADC-EK12DM		TC8750MHG	3-1/2 Digit ADC, Parallel BCD Output
ADC-EK12DR		TC8750EHG	3-1/2 Digit ADC, Parallel BCD Output
ADC-EK8B		TC8700CPG	8-Bit Binary ADC
ADC-ET10BM		TC8704MJG	10-Bit ADC/Tristate
ADC-ET10CM		TC8704CPG	10-Bit ADC/Tristate
ADC-ET12BC		TC8705CPG	12-Bit ADC/Tristate
ADC-ET12BM		TC8705BN	12-Bit ADC/Tristate
ADC-ET12BR		TC8705CN	12-Bit ADC/Tristate
AM-7650-1		TC7650CPA	Low-VOS Op Amp
VFQ-1C		TC9400CJ	VF/FV Converter (0.05% Linearity)
VFQ-1R		TC9400CL	VF/FV Converter (0.05% Linearity)
VFQ-2C		TC9401CJ	VF/FV Converter (0.01% Linearity)
VFQ-3C		TC9402CJ	VF/FV Converter (0.25% Linearity)
VI-7660-1		TC7660CPA	DC-to-DC Converter

Direct Replacement	Functional Equivalent	TelCom Part No.	Description

Ferranti

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
	ZN404	TC05BCZM	2.5V, 100PPM Reference
	ZN423	TC04BCZM	1.2V, 100PPM Reference
	ZN423	TC04BMRM	1.2V, 100PPM Reference

Harris/Intersil

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
ICL232CBE		TC232COE	RS-232 Interface
ICL232CBET		TC232COET/R	RS-232 Interface
ICL232CJE		TC232CJE	RS-232 Interface
ICL232CPE		TC232CPE	RS-232 Interface
ICL232IBE		TC232EOE	RS-232 Interface
ICL232IJE		TC232IJE	RS-232 Interface
ICL232IPE		TC232IPE	RS-232 Interface
ICL232MJE		TC232MJE	RS-232 Interface
	ICL7106CJL	TC7106CPL	3-1/2 Digit ADC, LCD: Not Available in CERDIP Package
ICL7106CM44		TC7106CKW	3-1/2 Digit ADC, LCD
ICL7106CPL		TC7106CPL	3-1/2 Digit ADC, LCD
ICL7106RCPL		TC7106RCPL	3-1/2 Digit ADC, LCD
	ICL7107CJL	TC7107CPL	3-1/2 Digit ADC, LED: Not Available in CERDIP Package
ICL7107CM44		TC7107CKW	3-1/2 Digit ADC, LED
ICL7107CPL		TC7107CPL	3-1/2 Digit ADC, LED
ICL7107RCPL		TC7107RCPL	3-1/2 Digit ADC, LED
ICL7109ACPL		TC7109ACPL	12-Bit Plus Sign Fast-Recovery ADC
ICL7109CPL		TC7109CPL	12-Bit Plus Sign ADC
ICL7109IJL		TC7109IJL	12 Bit Plus Sign ADC
	ICL7109MJL	TC7109IJL	12-Bit Plus Sign ADC: Not Available in MIL Temp Range
ICL7116CM44		TC7116CKW	3-1/2 Digit ADC with Display Hold, LCD
ICL7116CPL		TC7116CPL	3-1/2 Digit ADC with Display Hold, LCD
ICL7116RCPL		TC7116RCPL	3-1/2 Digit ADC with Display Hold, LCD
ICL7117CPL		TC7117CPL	3-1/2 Digit ADC with Display Hold, LED
ICL7117RCPL		TC7117RCPL	3-1/2 Digit ADC with Display Hold, LED
ICL7126CPL		TC7126CPL	Low-Power 3-1/2 Digit ADC, LCD
ICL7126RCPL		TC7126RCPL	Low-Power 3-1/2 Digit ADC, LCD
ICL7129CM44		TC7129CKW	4-1/2 Digit ADC, LCD
ICL7129CM44T		TC7129CKWT/R	4-1/2 Digit ADC, LCD
ICL7129CPL		TC7129CPL	4-1/2 Digit ADC, LCD
ICL7129RCPL		TC7129RCPL	4-1/2 Digit ADC, LCD
	ICL7135CJI	TC7135CPI	4-1/2 Digit ADC w/ Multiplexed BCD Output: Not Available in CERDIP Pkg.
	ICL7135CJI	TC835CPI (upgrade)	4-1/2 Digit ADC w/ Multiplexed BCD Output: Not Available in CERDIP Pkg.
ICL7135CPI		TC7135CPI	4-1/2 Digit ADC with Multiplexed BCD Output
ICL7135CPI		TC835CPI (upgrade)	4-1/2 Digit ADC with Multiplexed BCD Output
ICL7136CM44		TC7136CKW	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136CM44T		TC7136CKWT/R	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136CPL		TC7136CPL	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136RCPL		TC7136RCPL	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7650CPD		TC7650CPD	Low-VOS Op Amp
ICL7650IJD		TC7650IJD	Low-VOS Op Amp
ICL7652CPD		TC7652CPD	Low-VOS Op Amp
ICL7660CBA		TC7660COA	DC-to-DC Converter
ICL7660CPA		TC7660CPA	DC-to-DC Converter
ICL7660SCBA		TC7660SCOA	DC-to-DC Converter

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
Harris/Intersil (continued)			
ICL7660SCPA		TC7660SCPA	DC-to-DC with Boost Pin
ICL7660SCPA		TC7660SCPA	DC-to-DC Converter
	ICL7660SIBA	TC7660SEOA	DC-to-DC Converter
	ICL7660SIPA	TC7660SEPA	DC-to-DC Converter
ICL7662CPA		TC7662ACPA	High-Voltage DC-to-DC Converter
ICL7667CBA		TC426COA	Dual-Inverting Power MOSFET Driver
ICL7667CJA		TC426IJA	Dual-Inverting Power MOSFET Driver
ICL7667CPA		TC426CPA	Dual-Inverting Power MOSFET Driver
ICL7667MJA		TC426MJA	Dual-Inverting Power MOSFET Driver
ICM7211AIJL		TC7211AIJL	4-Digit LCD Driver
ICM7211AIPL		TC7211AIPL	4-Digit LCD Driver
ICM7211AMIPL		TC7211AMIPL	µP 4-Digit LCD Driver
ICM7212AIJL		TC7212AIJL	4-Digit LED Driver
ICM7212AIPL		TC7212AIPL	4-Digit LED Driver
ICM7212AMIPL		TC7212AMIPL	µP 4-Digit LED Driver
Hughes			
HLCD7211-2		TC7211AIPL	4-Digit LCD Driver
HLCD7211-4		TC7211AMIPL	µP 4-Digit LCD Driver
Linear Technology			
	LM185H-1.2	TC04AMRM	1.2V, 50PPM Reference
	LM185H-2.5	TC05AMRM	2.5V, 50PPM Reference
	LM385BZ-1.2	TC04ACZM	1.2V, 50PPM Reference
	LM385BZ-2.5	TC05ACZM	2.5V, 50PPM Reference
	LM385H-1.2	TC04ACZM	1.2V, 50PPM Reference
	LM385H-2.5	TC05ACZM	2.5V, 50PPM Reference
	LM385Z-1.2	TC04ACZM	1.2V, 50PPM Reference
	LM385Z-2.5	TC05ACZM	2.5V, 50PPM Reference
LT1081CJ		TC232IJE	RS-232 Interface
LT1081CN		TC232CPE	RS-232 Interface
LT1081CS		TC232COE	RS-232 Interface
LT1081MJ		TC232MJE	RS-232 Interface
LTC1044CN8		TC1044SCPA	DC-to-DC Converter
LTC1044CS8		TC7660SCOA	DC-to-DC Converter
	LTC1044MJ8	TC1044SCOA	DC-to-DC Converter
	LTC1049N8/S8	TC911CPA/COA	Low-VOS Op Amp
	LTC1050N8/S8	TC911CPA/COA	Low-VOS Op Amp
	LTC1051N8/S8	TC913CPA/COA	Low-VOS Dual Op Amp
LTC1052CJ		TC7652IJD	Low Noise Chopper/Amplifier
LTC1052CJ8		TC7652IJA	Low Noise Chopper/Amplifier
LTC1052CN8		TC7652CPA	Low Noise Chopper/Amplifier
LTC1052CPD		TC7652CPD	Low Noise Chopper/Amplifier
	LTC1053N/S	TC914CPD/COE	Low-VOS Quad Op Amp
	LTC1054CN	TC962CPA	High Output Power DC-to-DC Converter
	LTC1054MJ	TC962MJA	High Output Power DC-to-DC Converter
	LTC1150N8/S8	TC901CPA/COA	Low-VOS Op Amp, ±15V Supply
	UC1846J	TC170MJE	Current-Mode CMOS SMPS Controller
	UC1846J	TC18C46MJE	Current-Mode CMOS SMPS Controller
	UC1847J	TC18C47MJE	Current-Mode CMOS SMPS Controller

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
Linear Technology (Continued)			
	UC3846J	TC170IJE	Current-Mode CMOS SMPS Controller
	UC3846J	TC38C46COE	Current-Mode CMOS SMPS Controller
	UC3846N	TC170CPE	Current-Mode CMOS SMPS Controller
	UC3846N	TC38C46CPE	Current-Mode CMOS SMPS Controller
	UC3847J	TC38C47COE	Current-Mode CMOS SMPS Controller
	UC3847N	TC38C47CPE	Current-Mode CMOS SMPS Controller
Maxim			
ICL7106CJL		TC7106CPL	3-1/2 Digit ADC, LCD: Not Available in CERDIP Package
ICL7106CPL		TC7106CPL	3-1/2 Digit ADC, LCD
ICL7106CQH		TC7106CLW	3-1/2 Digit ADC, LCD
ICL7106RCPL		TC7106RCPL	3-1/2 Digit ADC, LCD
	ICL7107CJL	TC7107CPL	3-1/2 Digit ADC, LED: Not Available in CERDIP Package
ICL7107CPL		TC7107CPL	3-1/2 Digit ADC, LED
ICL7107CQH			
		TC7107CLW	
			3-1/2 Digit ADC, LED
ICL7107RCPL		TC7107RCPL	3-1/2 Digit AD, LED
ICL7109ACPL		TC7109ACPL	12-Bit Plus Sign ADC
ICL7109CPL		TC7109CPL	12-Bit Plus Sign ADC
ICL7109CQH		TC7109CLW	12-Bit Plus Sign ADC
ICL7109IJL		TC7109IJL	12 Bit Plus Sign ADC
	ICL7109MJL	TC7109IJL	12-Bit Plus Sign ADC: Not Available in CERDIP Package
	ICL7116CJL	TC7116CPL	3-1/2 Digit ADC with Display Hold, LCD: Not Available in CERDIP Package
ICL7116CPL		TC7116CPL	3-1/2 Digit ADC with Display Hold, LCD
ICL7116CQH		TC7116CLW	3-1/2 Digit ADC with Display Hold, LCD
ICL7116RCPL		TC7116RCPL	3-1/2 Digit ADC with Display Hold, LCD
ICL7117CPL		TC7117CPL	3-1/2 Digit ADC with Display Hold, LED
ICL7117CQH		TC7117CLW	3-1/2 Digit ADC with Display Hold, LED
ICL7117RCPL		TC7117RCPL	3-1/2 Digit ADC with Display Hold, LED
	ICL7126CJL	TC7126CPL	Low-Power 3-1/2 Digit ADC, LCD: Not Available in CERDIP Package
ICL7126CPL		TC7126CPL	Low-Power 3-1/2 Digit ADC, LCD
ICL7126CQH		TC7126CLW	Low-Power 3-1/2 Digit ADC, LCD
	ICL7126IPL	TC7126CPL	Low-Power 3-1/2 Digit ADC, LCD: Not Available in CERDIP Package
ICL7126RCPL		TC7126RCPL	Low-Power 3-1/2 Digit ADC, LCD
ICL7129ACQH		TC7129CLW	4-1/2 Digit ADC, LCD
ICL7129CPL		TC7129CPL	4-1/2 Digit ADC, LCD
	ICL7135CJI	TC7135CPI	4-1/2 Digit ADC w/ Multiplexed BCD Output: Not Available in CERDIP Pkg.
	ICL7135CJI	TC835CPI (upgrade)	4-1/2 Digit ADC w/ Multiplexed BCD Output: Not Available in CERDIP Pkg.
ICL7135CPI		TC7135CPI	4-1/2 Digit ADC with Multiplexed BCD Output
ICL7135CPI		TC835CPI (upgrade)	4-1/2 Digit ADC with Multiplexed BCD Output
ICL7135CQI		TC7135CLI	4-1/2 Digit ADC with Multiplexed BCD Output
ICL7135CQI		TC835CLI (upgrade)	4-1/2 Digit ADC with Multiplexed BCD Output
	ICL7136CJL	TC7136CPL	Fast-Recovery 3-1/2 Digit ADC, LCD: Not Available in CERDIP Package
ICL7136CMH		TC7136CKW	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136CPL		TC7136CPL	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136CQH		TC7136CLW	Fast-Recovery 3-1/2 Digit ADC, LCD
ICL7136RCPL		TC7136RCPL	Fast-Recovery 3-1/2 Digit ADC, LCD
	ICL7650BCPD	TC7650CPD	Low-VOS Op Amp
	ICL7650BIJD	TC7650IJD	Low-VOS Op Amp
ICL7650CPD		TC7650CPD	Low-VOS Op Amp

Cross-Reference Guide

Maxim (Continued)

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
ICL7650IJD		TC7650IJD	Low-VOS Op Amp
ICL7652CPA		TC7652ZCPA	Low Noise Chopper-Stabilized Amplifier
ICL7652CPD		TC7652CPD	Low-VOS Op Amp
ICL7652IJA		TC7652ZIJA	Low Noise Chopper-Stabilized Amplifier
ICL7652IJD		TC7652IJD	Low-VOS Op Amp
ICL7660CBA		TC7660COA	DC-to-DC Converter
ICL7660CPA		TC7660CPA	DC-to-DC Converter
ICL7660CPA		TC7660CPA	DC-to-DC Converter
ICL7660CSA		TC7660COA	DC-to-DC Converter
ICL7660EPA		TC7660EOA	DC-to-DC Converter
ICL7660IJA		TC7660IJA	DC-to-DC Converter
ICL7660MJA		TC7660MJA	DC-to-DC Converter
ICL7662CPA		TC7662ACPA	High Voltage DC-to-DC Converter
ICM7211AIJL		TC7211AIJL	4-Digit LCD Driver
ICM7211AIPL		TC7211AIPL	4-Digit LCD Driver
ICM7211AMIPL		TC7211AMIPL	µP 4-Digit LCD Driver
ICM7212AIJL		TC7212AIJL	4-Digit LED Driver
ICM7212AIPL		TC7212AIPL	4-Digit LED Driver
ICM7212AMIPL		TC7212AMIPL	µP 4-Digit LED Driver
MAX232CPE		TC232CPE	RS-232 Interface
MAX232CWE		TC232COE	RS-232 Interface
MAX232EJE		TC232EJE	RS-232 Interface
MAX232EPE		TC232EPE	RS-232 Interface
MAX232EWE		TC232EOE	RS-232 Interface
MAX232MJE		TC232MJE	RS-232 Interface
MAX4420CSA		TC4420COA	6A Power Driver
MAX4420CPA		TC4420CPA	6A Power Driver
MAX4429CSA		TC4429COA	6A Power Driver
MAX4429CPA		TC4429CPA	6A Power Driver
	MAX626CPA	TC4426ACPA	Improved Speed and IDD
	MAX626CSA	TC4426ACOA	Improved Speed and IDD
MAX626CPA		TC4426CPA	1.5A Dual-Output Power Driver
MAX626CSA		TC4426COA	1.5A Dual-Output Power Driver
MAX626MJA		TC4426MJA	1.5A Dual-Output Power Driver
	MAX627CPA	TC4427ACPA	Improved Speed and IDD
	MAX627CSA	TC4427ACOA	Improved Speed and IDD
MAX627CPA		TC4427CPA	1.5A Dual-Output Power Driver
MAX627CSA		TC4427COA	1.5A Dual-Output Power Driver
MAX627MJA		TC4427MJA	1.5A Dual-Output Power Driver
	MAX628CPA	TC4428ACPA	Improved Speed and IDD
	MAX628CSA	TC4428ACOA	Improved Speed and IDD
MAX628CPA		TC4428CPA	1.5A Dual-Output Power Driver
MAX628CSA		TC4428COA	1.5A Dual-Output Power Driver
MAX628MJA		TC4428MJA	1.5A Dual-Output Power Driver
	MAX709	TC54	Voltage Detector
	MAX7129ACJL	TC7129CPL	4-1/2 Digit LCD Drive ADC: Not Available in CERDIP Package
MAX7129ACPL		TC7129CPL	4-1/2 Digit LCD Drive ADC
MAX7129ACQ		TC7129CLW	4-1/2 Digit LCD Drive ADC
MAX7129ARCPL		TC7129RCPL	4-1/2 Digit LCD Drive ADC
TSC426CBA		TC426COA	1.5A Dual-Output Power Driver

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
Maxim (Continued)			
TSC426CPA		TC426CPA	1.5A Dual-Output Power Driver
TSC426IJA		TC426IJA	1.5A Dual-Output Power Driver
TSC426MJA		TC426MJA	1.5A Dual-Output Power Driver
TSC426MJA/HR		TC426MJA/HR	1.5A Dual-Output Power Driver
TSC427CBA		TC427COA	1.5A Dual-Output Power Driver
TSC427CPA		TC427CPA	1.5A Dual-Output Power Driver
TSC427IJA		TC427IJA	1.5A Dual-Output Power Driver
TSC427MJA		TC427MJA	1.5A Dual-Output Power Driver
TSC427MJA/HR		TC427MJA/HR	1.5A Dual-Output Power Driver
TSC428CBA		TC428COA	1.5A Dual-Output Power Driver
TSC428CPA		TC428CPA	1.5A Dual-Output Power Driver
TSC428IJA		TC428IJA	1.5A Dual-Output Power Driver
TSC428MJA		TC428MJA	1.5A Dual-Output Power Driver
TSC428MJA/HR		TC428MJA/HR	1.5A Dual-Output Power Driver
	ICL7117CJL	TC7117CPL	3-1/2 Digit ADC with Display Hold, LED: Not Available in CERDIP Package
Micrel			
MIC1426CM		TC1426COA	1.2A Dual-Output Power Driver
MIC1426CN		TC1426CPA	1.2A Dual-Output Power Driver
MIC1427CM		TC1427COA	1.2A Dual-Output Power Driver
MIC1427CN		TC1427CPA	1.2A Dual-Output Power Driver
MIC1428CM		TC1428COA	1.2A Dual-Output Power Driver
MIC1428CN		TC1428CPA	1.2A Dual-Output Power Driver
MIC426AJ		TC426MJA	1.5A Dual-Output Power Driver
MIC426BJ		TC426IJA	1.5A Dual-Output Power Driver
MIC426BM		TC426EOA	1.5A Dual-Output Power Driver
MIC426CM		TC426COA	1.5A Dual-Output Power Driver
MIC426CN		TC426CPA	1.5A Dual-Output Power Driver
MIC427AJ		TC427MJA	1.5A Dual-Output Power Driver
MIC427BJ		TC427IJA	1.5A Dual-Output Power Driver
MIC427BM		TC427EOA	1.5A Dual-Output Power Driver
MIC427CM		TC427COA	1.5A Dual-Output Power Driver
MIC427CN		TC427CPA	1.5A Dual-Output Power Driver
MIC428AJ		TC428MJA	1.5A Dual-Output Power Driver
MIC428BJ		TC428IJA	1.5A Dual-Output Power Driver
MIC428BM		TC428EOA	1.5A Dual-Output Power Driver
MIC428CM		TC428COA	1.5A Dual-Output Power Driver
MIC428CN		TC428CPA	1.5A Dual-Output Power Driver
MIC4420AJ		TC4420MJA	6A Power Driver
MIC4420BJ		TC4420IJA	6A Power Driver
MIC4420CT		TC4420CAT	6A Power Driver
MIC4421AJ		TC4421MJA	9A Power Driver
MIC4421BN		TC4421EPA	9A Power Driver
MIC4421CN		TC4421CPA	9A Power Driver
MIC4421CT		TC4421CAT	9A Power Driver
MIC4422AJ		TC4422MJA	9A Power Driver
MIC4422BN		TC4422EPA	9A Power Driver
MIC4422CN		TC4422CPA	9A Power Driver
MIC4422CT		TC4422CAT	9A Power Driver
MIC4423AJ		TC4423MJA	3A Dual-Output Power Driver

Cross-Reference Guide

Micrel (Continued)

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
MIC4423BJ		TC4423IJA	3A Dual-Output Power Driver
MIC4423BN		TC4423EPA	3A Dual-Output Power Driver
MIC4423BWM		TC4423EOE	3A Dual-Output Power Driver
MIC4423CN		TC4423CPA	3A Dual-Output Power Driver
MIC4423CWM		TC4423COE	3A Dual-Output Power Driver
MIC4424AJ		TC4424MJA	3A Dual-Output Power Driver
MIC4424BJ		TC4424IJA	3A Dual-Output Power Driver
MIC4424BN		TC4424EPA	3A Dual-Output Power Driver
MIC4424BWM		TC4424EOE	3A Dual-Output Power Driver
MIC4424CN		TC4424CPA	3A Dual-Output Power Driver
MIC4424CWM		TC4424COE	3A Dual-Output Power Driver
MIC4425AJ		TC4425MJA	3A Dual-Output Power Driver
MIC4425BJ		TC4425IJA	3A Dual-Output Power Driver
MIC4425BN		TC4425EPA	3A Dual-Output Power Driver
MIC4425BWM		TC4425EOE	3A Dual-Output Power Driver
MIC4425CN		TC4425CPA	3A Dual-Output Power Driver
MIC4425CWM		TC4425COE	3A Dual-Output Power Driver
MIC4426AJ		TC4426MJA	1.5A Dual-Output Power Driver
MIC4426BJ		TC4426IJA	1.5A Dual-Output Power Driver
MIC4426BM		TC4426EOA	1.5A Dual-Output Power Driver
MIC4426BN		TC4426EPA	1.5A Dual-Output Power Driver
MIC4426CM		TC4426COA	1.5A Dual-Output Power Driver
MIC4426CN		TC4426CPA	1.5A Dual-Output Power Driver
MIC4427AJ		TC4427MJA	1.5A Dual-Output Power Driver
MIC4427BJ		TC4427IJA	1.5A Dual-Output Power Driver
MIC4427BM		TC4427EOA	1.5A Dual-Output Power Driver
MIC4427BN		TC4427EPA	1.5A Dual-Output Power Driver
MIC4427CM		TC4427COA	1.5A Dual-Output Power Driver
MIC4427CN		TC4427CPA	1.5A Dual-Output Power Driver
MIC4428AJ		TC4428MJA	1.5A Dual-Output Power Driver
MIC4428BJ		TC4428IJA	1.5A Dual-Output Power Driver
MIC4428BM		TC4428EOA	1.5A Dual-Output Power Driver
MIC4428BN		TC4428EPA	1.5A Dual-Output Power Driver
MIC4428CM		TC4428COA	1.5A Dual-Output Power Driver
MIC4428CN		TC4428CPA	1.5A Dual-Output Power Driver
MIC4429AJ		TC4429MJA	6A Power Driver
MIC4429BJ		TC4429IJA	6A Power Driver
MIC4429BM		TC4429EOA	6A Power Driver
MIC4429BN		TC4429EPA	6A Power Driver
MIC4429CM		TC4429COA	6A Power Driver
MIC4429CN		TC4429CPA	6A Power Driver
MIC4429CT		TC4429CAT	6A Power Driver
MIC4467AJ		TC4467MJD	1.2A Quad-Output Power Driver
MIC4467BJ		TC4467EJD	1.2A Quad-Output Power Driver
MIC4467BN		TC4467EPD	1.2A Quad-Output Power Driver
MIC4467BWM		TC4467EOE	1.2A Quad-Output Power Driver
MIC4467CN		TC4467CPD	1.2A Quad-Output Power Driver
MIC4467CWM		TC4467COE	1.2A Quad-Output Power Driver
MIC4468AJ		TC4468MJD	1.2A Quad-Output Power Driver
MIC4468BJ		TC4468EJD	1.2A Quad-Output Power Driver

Micrel (Continued)

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
MIC4468BN		TC4468EPD	1.2A Quad-Output Power Driver
MIC4468BWM		TC4468EOE	1.2A Quad-Output Power Driver
MIC4468CN		TC4468CPD	1.2A Quad-Output Power Driver
MIC4468CWM		TC4468COE	1.2A Quad-Output Power Driver
MIC4469AJ		TC4469MJD	1.2A Quad-Output Power Driver
MIC4469BJ		TC4469EJD	1.2A Quad-Output Power Driver
MIC4469BN		TC4469EPD	1.2A Quad-Output Power Driver
MIC4469BWM		TC4469EOE	1.2A Quad-Output Power Driver
MIC4469CN		TC4469CPD	1.2A Quad-Output Power Driver
MIC4469CWM		TC4469COE	1.2A Quad-Output Power Driver

Micropower

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
MP5010GN		TC9491BJ	1.2V, 100PPM Reference
MP5010JT		TC9491BM	1.2V, 100PPM Reference
MP5010KT		TC9491AM	1.2V, 50PPM Reference
MP5010MN		TC9491AJ	1.2V, 50PPM Reference

Motorola

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
MC14433L		TC14433CL	3-1/2 Digit ADC with Multiplexed BCD Output
MC14433P		TC14433CJ	3-1/2 Digit ADC with Multiplexed BCD Output
	MMH0026CP1	TC426CPA	Dual-Inverting Power MOSFET Driver
	MMH0026CU	TC426IJA	Dual-Inverting Power MOSFET Driver
	SG1525AJ	TC15C25MJE	Voltage-Mode PWM Controller
	SG1527AJ	TC15C27MJE	Voltage-Mode PWM Controller
	SG2525AN	TC25C25EPE	Voltage-Mode PWM Controller
	SG2527AN	TC25C27EPE	Voltage-Mode PWM Controller
	SG3525AN	TC35C25CPE	Voltage-Mode PWM Controller
	SG3527AN	TC35C27CPE	Voltage-Mode PWM Controller
	UC2842AD	TC28C42EOE	Current-Mode PWM Controller
	UC2842AJ	TC28C42EJA	Current-Mode PWM Controller
	UC2842AN	TC28C42CPA	Current-Mode PWM Controller
	UC2843AD	TC28C43EOE	Current-Mode PWM Controller
	UC2843AJ	TC28C43EJA	Current-Mode PWM Controller
	UC2843AN	TC28C43EPA	Current-Mode PWM Controller
	UC2844AD	TC28C44EOE	Current-Mode PWM Controller
	UC2844AJ	TC28C44EJA	Current-Mode PWM Controller
	UC2844AN	TC28C44EPA	Current-Mode PWM Controller
	UC2845AD	TC28C45EOE	Current-Mode PWM Controller
	UC2845AJ	TC28C45EJA	Current-Mode PWM Controller
	UC2845AN	TC28C45EPA	Current-Mode PWM Controller
	UC3842AD	TC38C42COE	Current-Mode PWM Controller
	UC3842AN	TC38C42CPA	Current-Mode PWM Controller
	UC3843AD	TC38C43COE	Current-Mode PWM Controller
	UC3843AN	TC38C43CPA	Current-Mode PWM Controller
	UC3844AD	TC38C44COE	Current-Mode PWM Controller
	UC3844AN	TC38C44CPA	Current-Mode PWM Controller
	UC3845AD	TC38C45COE	Current-Mode PWM Controller
	UC3845AN	TC38C45CPA	Current-Mode PWM Controller

Cross-Reference Guide

National

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
	DS0026CJ-8	TC426IJA	Dual-Inverting Power MOSFET Driver
	DS0026CN-8	TC426CPA	Dual-Inverting Power MOSFET Driver
	DS0026J-8	TC426MJA	Dual-Inverting Power MOSFET Driver
	LM185H-1.2	TC04AMRM	1.2V, 100PPM Reference
	LM185H-2.5	TC05AMRM	2.5V, 100PPM Reference
	LM231	TC9401	VF/FV Converter (0.01%)
	LM231A	TC9401	VF/FV Converter (0.01%)
	LM331	TC9401	VF/FV Converter (0.01%)
	LM331A	TC9401	VF/FV Converter (0.01%)
LM385Z-1.2		TC385B-1.2	1.2V, 100PPM Reference
LM385Z-2.5		TC385B-2.5	2.5V, 100PPM Reference
LMC7660IN		TC7660EPA	DC-to-DC Converter
LMC7660MJ		TC7660MJA	DC-to-DC Converter

SGS

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
	UC1842J	TC18C42MJA	SMPS, Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	UC1843J	TC18C43MJA	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	UC1846J	TC18C46MJE	Current-Mode Push-Pull SMPS Controller
	UC1847J	TC18C47MJE	Current-Mode Push-Pull SMPS with Inverse Output
	UC2842J	TC28C42IJA	SMPS, Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	UC2843D	TC28C43IOE	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	UC2846J	TC28C46IJE	Current-Mode Push-Pull SMPS Controller
	UC2847J	TC28C47IJE	Current-Mode Push-Pull SMPS with Inverse Output
	UC3842D	TC38C42COE	SMPS, Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	UC3842N	TC38C42CPA	SMPS, Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	UC3843D	TC38C43COE	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	UC3843N	TC38C43CPA	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	UC3846J	TC38C46CPE	Current-Mode Push-Pull SMPS Controller
	UC3846N	TC38C46CJE	Current-Mode Push-Pull SMPS Controller
	UC3847J	TC38C47CPE	Current-Mode Push-Pull SMPS with Inverse Output
	UC3847N	TC38C47CJE	Current-Mode Push-Pull SMPS with Inverse Output

Silicon General (Linfinity Micro Electronics)

Direct Replacement	Functional Equivalent	TelCom Part No.	Description
	SG1525J	TC15C25MJE	Voltage-Mode PWM Controller
	SG1527J	TC15C27MJE	Voltage-Mode PWM Controller
	SG1626Y	TC426MJA	Dual-Inverting Power MOSFET Driver
	SG1846J	TC18C46MJE	Current-Mode CMOS SMPS Controller
	SG1847J	TC18C47MJE	Current-Mode CMOS SMPS Controller
	SG2525J	TC25C25EPE	Voltage-Mode PWM Controller
	SG2527J	TC25C27EPE	Voltage-Mode PWM Controller
	SG2626M	TC426IJA	Dual-Inverting Power MOSFET Driver
	SG2846J	TC28C46EPE	Current-Mode CMOS SMPS Controller
	SG2847J	TC28C47EPE	Current-Mode CMOS SMPS Controller
	SG3525J	TC35C25CPE	Voltage-Mode PWM Controller
	SG3527J	TC35C27CPE	Voltage-Mode PWM Controller
	SG3626M	TC426CPA	Dual-Inverting Power MOSFET Driver
	SG3842N	TC38C42CPA	SMPS Controller: I-Mode, Single-Ended, 16V Start, 99% DC
	SG3843N	TC38C43CPA	SMPS Controller: I-Mode, Single-Ended, 8V Start, 99% DC
	SG3846DW	TC38C46COE	Current-Mode CMOS SMPS Controller
	SG3846N	TC38C46CPE	Current-Mode CMOS SMPS Controller
	SG3847DW	TC38C47COE	Current-Mode CMOS SMPS Controller
	SG3847N	TC38C47CPE	Current-Mode CMOS SMPS Controller